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In this Issue—

GAS ROASTING OF PELLETS
Experiments in a Soviet Vertical-shaft Furnace - page 631

COAL MARKETING
Need for a Consistent Product - - - - page 637

PERSONAL AND PUBLIC RELATIONS
United Steel Chairman's Views - - - - page 643

SAMPLING OF COAL
New British Standard Specification - - - page 647

OXYGEN LANCES IN OPEN-HEARTH ROOFS
US Steel Corporation's Experience - - - page 653

	PAGE
Leading Article: British Railways	621
Amendments to Iron and Steel Bill	622
Dangers of Steel Stockpiling	622
GEC Furnaces for Plutonium Metal Production	622
Pattern of Expansion	623
Ironfounding's Future	623
Passing Thoughts	624
Warning to Coal Merchants	625
Appointments	626
US Steel Corporation Income Affected by Strike	626
Law Cases	627
European Steel	629
Electric Transporters in New P&O Liner	629
Coal-mining Outlook "Not Dispiriting"	630
Runner-up Ineligible for NUM Presidency	630
Iron and Steel Institute: Special Meeting in Italy	634
Forthcoming Events	634
Hawthorn Combined Mine Scheme	635
Light-weight Mine Roof Bars	635
Publications Received	636
Safety in Mines Research	636
New Patents	642
Arc Melting Furnace at Durgapur	644
Metallurgical Progress	645
Steel Industry Personnel	649
Marine Sedimentary Iron Ores	650
New Equipment	651
Determination of Gases in Metals	654
All Stanton Furnaces Back in Blast	656
Improved Order Position of Armstrong, Stevens	656
Joint Award of James Clayton Prize	656
Company News	657
African Notes	659
Non-ferrous Metals	660
Increased Traffic for South Wales Ports	660
Engineers to Recommend New Pay Claim	660
Iron and Steel Trade	661
Favourable Outlook for Canadian Steel Industry	661
Coal Board's Appliance Credit Scheme	662
Coalbrook Company Wins Appeal: Mine Re-opens	662
Obituary	663
Coal Output Comparison with 1959	664
Duke of Edinburgh Emphasizes Importance of Coal	664
Personal	665
In Parliament	666
The Coal Trade	667
Reduction Checked in ECSC Coal Stocks	667
Orders Placed	668
News in Brief	669
Big Extension to GKN Tremorfa Works	670
Coal Stocks Position	670
The Scrap Markets	671
Change in ECSC Charter	671
Europe's Top Foundry Apprentices to Compete in Midlands	671
Coalfield News	672
Board Changes	674
Increases of Capital	676
Coal Wins Customers from Oil in Yorkshire	676
Pit Worker Killed in "Freak" Accident	676

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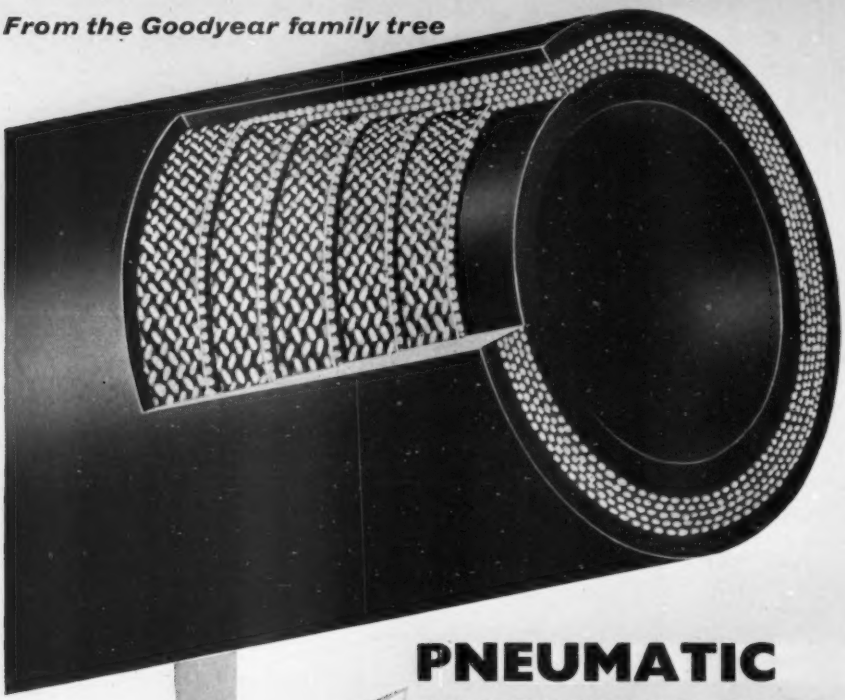

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IRON AND COAL
TRADES REVIEW

Vol. 180 March 18, 1960 No. 4,783

British Railways

ACCUMULATIVE deficit of some £350,000,000 for the British Transport Commission, with a further £80,000,000 for the current year, coupled with the recommendations of the Guillebaud Committee, have startled transport economists. There is much speculation as to how the Government is going to bridge the gap between falling receipts and rising expenditure without providing some form of temporary accommodation in the way of an overt or hidden subsidy.

The railways are obliged both to maintain and operate a modern service and are yet severely hampered in the scale of charges they are permitted to impose. Onerous duties of a common carrier remain. Further, while the citizen must pay an economic price for most of his goods and services he is yet permitted the luxury of travelling "on the cheap." Many argue with some cogency that the continuance of cheap fares is quite unjustified, particularly in an era of high wage rates and insubstantial unemployment. The BTC is thus operating in an economic straightjacket.

The Government has wisely decided that the transport nettle must be grasped immediately. Let us look at some of the Government's recommendations.

"The industry must be of a size and pattern suited to modern conditions and prospects." This appears to embody the view of the British Transport Reappraisal Plan published in July, 1959, to the following effect: "At the same time adaptation of the system to modern conditions implies concentration on the tasks for which railways are best suited and the elimination of any elements in the system which are not necessary for the fulfilment of these tasks" (Para. 121). This, of course, is subject to wide interpretation.

Historically, coal has been one of the most important traffics for the railways. Thus, in 1957 167,000,000 tons of coal and coke carried by the network accounted for 61 per cent. of the revenue tons carried by freight trains and 36 per cent. of freight receipts. The railways must, however, accept the position that future trends may move to their disadvantage. Not merely is a reduction of coal consumption a sign of the times, but methods are being developed for the utilization of coal at or near the pitheads instead of in the cities themselves. Thus, with the growing use of the Lurgi process for the gasification of small coals—one plant is in operation in Fife and a second, at Coleshill, Birmingham, is scheduled for operation by 1963—gas produced at the coalfields will be fed into the grid, and no question will arise about the marketing of coke, as it is eliminated in the process. Hydrogenation of oil or coal and the use of petroleum fractions and tail gases from refineries are all calculated to provide the gas industry over the years with a suitable end product and yet abate the industry's liability for heavy freight charges. Much the same argument could be applied to electricity generation.

Another indication of the times is the movement of petroleum products and chemical feedstock by pipeline in preference to rail and sea transit. The projected products line from Fawley to London Airport and the ethylene line from Fawley to the new ICI plant on the Severn reveal the method that industry is considering to move products which were hitherto shipped by vessel, road, or rail.

Only two illustrations have been adduced to identify the trend the railways must face. On the other hand, with the increased production of steel and the diverse location of industry rail receipts may be expected to receive some benefit. Sight should not, however, be lost of the fact that with the construction of first-class roads like the M1, which enable rapid and efficient service from door to door, merchandise may possibly be deflected from the railways, particularly if road and rail freights move further out of line.

While the proportions of inland goods transported by rail have declined from 22,391,000,000 ton-miles in 1952 to 18,426,000,000 ton-miles in 1958, representing 54 per cent. and 44 per cent. of the national total, the corresponding figures for the roads are 18,800,000,000 ton-miles and 23,100,000,000 ton-miles, or 46 per cent. and 56 per cent., respectively. This has been due in part to the substantial expansion in the commercial vehicle fleet, which rose from 747,000 in 1948 to about 1,300,000 in September, 1959. An inhibiting factor has been, of course, the state of British roads, but this problem between the principal cities is in the course of being remedied.

It would seem, therefore, that the first thing to do is to consider what is the function of the railways in the 'sixties and the 'seventies, if not beyond, and to seek to implement these findings. A diminished network may be justifiably forecast, while every attempt should be made to ensure that the railways are competitive with other systems of transport, particularly in such sectors as the carriage of heavy plant, machinery, and steel (providing that speed

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in delivery is secured) and the movement of population masses from urban areas to city centres for work.

A great deal of rethinking is desirable on our transport system before further outlays are authorized. The utility of pipelines, helicopters, hovercraft, monorails, and so forth cannot be ignored even at this stage, or else we may discover that our conventional system is outmoded before its reconstruction has been completed.

Sacrifice and increased burdens are part of the price the public may be called upon to pay to secure the necessary adjustment. Pruning the BTC of its extraneous activities and sale of properties and assets not fully employed is part of the price the commission may have to pay for its recovery and eventual viability. The rank and file in the industry have their part to play in this major reorganization. They should accept the chill wind of change and help their industry in its strenuous efforts forward. Only then is an injection of further substantial finance warranted.

Amendments to Iron and Steel Bill

WITH the object of drastically reducing the amount the Government can lend from the Consolidated Fund to finance the building of new steel strip mills in Wales and Scotland, six Conservative MPs on Wednesday tabled amendments to the Iron and Steel (Financial Provisions) Bill. The amendments would reduce the amount to be borrowed from £120,000,000 to £30,000,000 and cut the period in which the borrowing could take place from four years to one year.

The Bill, which is due to come up in committee in the House of Commons next week, has been introduced to allow loans to be made to Colvilles, Limited (£50,000,000) and Richard Thomas & Baldwins, Limited (£70,000,000).

Signatories to the amendments are Mr. Gerald Nabarro (Kidderminster), Mr. John Peyton (Yeovil), Lord Hinchingbrooke (South Dorset), Mr. John Eden (Bournemouth, West), Mr. Paul Williams (Sunderland, South), and Mr. John Biggs-Davison (Chigwell).

CANADA'S LARGEST OPEN-HEARTH FURNACE

NAMES of the companies who will build Canada's largest open-hearth furnace for the Steel Company of Canada, Limited, have been announced. The $18,500,000 furnace is part of a $60,000,000 expansion programme. Dominion Bridge has been awarded the contract for furnace building and steelwork, Western Pile & Foundation, the contract for piling, and Pigott Construction, of Hamilton, the contract for excavation.

When the furnace comes into operation later this year it will be capable of producing 400 tons of steel every eight or nine hours. The largest furnaces at Stelco now are capable of delivering 325 tons.

Dangers of Steel Stockpiling

BECAUSE some types of steel were in short supply, some manufacturers were ordering more than they needed in order to build up a stock, said Prof. D. C. Hague, Professor of Applied Economics at Sheffield University, addressing a conference of the Institute of Personnel Management at Buxton last week. This made it appear, he said, that the supply was shorter than it actually was, and consequently the manufacturers placed even larger orders.

"I believe we owe a duty to ourselves to try and damp down this stock building development," said Prof. Hague. "We need stocks as shock absorbers when supplies are low, but it is a fact that when they should have been going up, stocks have actually been going down." He said that "if peace were to break out," the country would be faced with an economic problem. "Instead of spending money on defence we would be able to spend it on ourselves," he said.

It seemed clear that as the country got richer, its extra wealth would be spent during extra leisure time with the shorter working week and a shorter working life.

Turning to the stockpiling of coal, Prof. Hague said: "I do not attack anyone who, as they did last summer, piled up valleys full of coal that no one expects to be emptied, in order to keep people at work. It was better than putting the men on the dole."

He said that increasing efficiency in the use of coal was an added difficulty to an industry already facing competition from oil. It was unfortunate, he went on, that the coal industry should be so embarrassed, but he added: "We must regard it as a heaven-sent opportunity to reduce the number of men and machines in the coal industry and use them in other industries where labour and equipment are hard pressed. This will lead to serious human problems, but problems exist only to be solved."

Prof. Hague praised as a "milestone in economic policy," recent decisions of the car firms to move to Merseyside. It meant that firms supplying component parts would also move to Merseyside to be near the consumer.

GEC Furnaces for Plutonium Metal Production

FURTHER contract from the United Kingdom Atomic Energy Authority, Risley, for electric furnaces for use in the production of plutonium metal has been received by the General Electric Company, Limited. The latest order covers reduction and fluorination furnaces.

The fluorination furnace is rated at 10 kW. and is of the horizontal front-loading type, complete with muffles, the inner surface of the muffles and doors being lined with platinum. A forced cooling system is incorporated to enable the charge to be cooled within a stipulated time. The furnace for the reduction process is rated at 50 kW. It is of a bell type design and has a forced cooling system similar to the fluorination furnace.

Electrical equipment being supplied includes regulating transformers, temperature control gear, and the necessary switchgear.

Pattern of Expansion

ESTIMATES OF 1960 SPENDING BY STEEL

RESULTS of the annual survey of capital expenditure in the iron and steel industry show that the industry's expenditure in 1959 was £99,000,000, compared with £105,000,000 in 1958, states the Iron and Steel Board in its latest production statement. The 1960 estimates indicate a substantial increase, but in previous years it has been found that the forecasts of future expenditure resulting from the aggregation of individual companies' figures are not realized in full.

On the basis of past experience it is considered that the actual expenditure in 1960 is likely to be of the order of £120,000,000 to £125,000,000—a large part of the increase being due to the strip mill programme. The amount devoted to raw material treatment and blast furnaces is expected to decline proportionately but not absolutely—it was 25 per cent. in 1958, 23 per cent. last year, and is expected to be 20 per cent. this year.

Previous heavy expenditure on iron-making plant has made it possible so far for the industry to avoid importing high-cost scrap while in recent months increasing steel production at a rapid rate.

Steel Consumption Catching Up

Percentage of capital expenditure on coke ovens is expected to decline from 9 per cent. in 1958 to 7 per cent. this year. After dropping by 1 per cent. last year to 12 per cent., it is expected that some 15 per cent. will be spent on melting shops this year and up to 53 per cent. on mills and finishing plant.

Steel consumption in the last quarter of 1959 was 12 per cent. above that in the corresponding quarter of 1958, but still about 3 per cent. below the highest level which was reached in the third quarter of 1957. Stocks of steel held by private industry began to increase once again in the last quarter of 1959, although this was accompanied by a heavy fall in stocks held by public organizations.

The continued rise in steel production in January and February of this year indicates that consumption is increasing further and that the building up of stocks is probably now taking place on a substantial scale, at least in the private section.

Alongside steel's record achievement in February, pig-iron production also reached a new record level at an average weekly rate of 301,500 tons. This compares with 297,500 tons in January and 221,800 tons in February, 1959.

STEELWORKS BAND REACHES NATIONAL FINALS

DANNEMORA Steelworks Band came second with 182 points in the fourth division of the north-eastern area contest of the Daily Herald National Brass Band Championship at Huddersfield on Saturday and qualified to compete in the finals in London next October.

Winner of this division, in which there were 19 contestants, was Clayton West Brass Band, with Rossington Main Colliery Welfare, third. Both also qualify for the finals.

Ironfounding's Future

DURING the 10 years from 1950 to 1959, no fewer than 370 ironfoundries had been closed, said Mr. W. James, the chairman, at the annual meeting of the National and Midland Ironfounders' Association, last week.

The reasons for closing were not always easy to establish, said Mr. James. Probably the main reason for closing many of them was the capital expenditure needed to bring the foundries up to date and install the costly amenity schemes which were now required. Another reason might well be the unprofitable nature of the foundry industry generally, especially during the somewhat depressing trade conditions of the last few years. A third reason was the action of many of the larger concerns in closing their own foundries and purchasing their requirements from other foundries specializing in the type of castings they required.

It would be wrong to conclude that the production of iron castings in the future would be concentrated within the limits of a few large concerns, but it did mean that there was being created what might be described as a minimum size unit, varying in some ways according to the type of product made, but large enough to ensure the highest possible standards in working conditions and capable of taking advantage of technological advancements.

European Effort on Nuclear Power is Urged

PRESENT temporary abundance of coal and oil is described in the second report of the European Nuclear Energy Agency as a respite, of which the countries of Europe should take full advantage. During this period, the agency urges, they should gain experience from the operation of the first nuclear power-stations, develop and improve existing types of nuclear reactors, investigate new types that seem promising, and solve outstanding technical problems.

To avoid dependence on imports, the report continues, Europe would again have to turn to nuclear energy in 10 or 20 years' time at the most. Joint action was essential if the countries were to cover the full field of research and experiment.

MINES RESCUE TRAINING STATION of the West Midlands Divisional Coal Board at Dudley has been closed and its activities transferred to the North Staffordshire coalfield.

Passing Thoughts . . .

WHAT stops people dead in their tracks when considering whether machines can think is the fact that the working of the brain is often unpredictable. So it is that if we want to start building machines with brain-like aptitudes they must also be unpredictable. It is not that they must operate at random, but they must base their activity on sets of probabilities. And this can be done—it has been done.—MR. STAFFORD BEER, head of the operational research and cybernetics department of the United Steel Companies, Limited, broadcasting in the Home Service.

Nationalization is one of the principal reasons why this country is the most highly taxed nation in the world. In a private concern all the capital is found by the directors and shareholders. In the case of a nationalized industry the capital is provided by the compulsory shareholders—the taxpaying general public. They have no say whatsoever in the running of the industry. All they do is pay.—Letter in the Yorkshire Post.

If we are to have full employment and an advancing economy with a classless society, then I think you have to have a substantial measure of common ownership in various forms; some proportion in the form we know it best—State monopolies; some incorporative organizations; some under municipal ownership, and some in Government participation and ownership of shares in private concerns.—MR. HUGH GAITSKELL, Leader of the Opposition.

If we really mean business we shall need public or co-operative ownership of banking and insurance, including the money market, steel, oil refining and distribution, machine tools, heavy electrical equipment, chemicals, building materials, coal-mining machinery, coal distribution, urban land, and long-distance road haulage. That is not an exclusive list, but it is something we can start with.—MR. WILLIAM WARBEY, *Labour MP for Ashfield (Notts).*

Every wasteful practice irrespective of its origin, whether in trade union ranks or ranks of management, must be ruthlessly eliminated. Privileges of any sort, whether in the form of a shorter working week, higher earnings, or profits must be earned by skill, ingenuity, and sheer hard unremitting toil. Our future lies in our own hands.—DR. DENIS REBBECK, deputy managing director of Harland & Wolff, Limited, Belfast shipbuilders.

British industry will never be as secure and progressive as it should be until the engineer is given his right and proper place in management.—SIR WILLIAM ROBSON-BROWN, MP.

In the past, technical education had been bled white by industry. It is time there was a feed-back from industry to education. Otherwise the next generation of scientists and engineers will be impoverished.—MR. K. L. STRETCH, director of the NCB Central Engineering Establishments, who has been appointed vice-principal of the College of Advanced Technology, Birmingham.

The spectre of a revolutionary national wage policy, modelled on Guillebaud and leading to a cataract of leap-frogging demands affecting the whole economy, is viewed with dismay.—Stoke-on-Trent Evening Sentinel.

Closely related to marketing is public relations. One objective of our public relations programme is so basic that we often overlook it—and that is to impress upon the public that the coal industry is still in business.—MR. STEPHEN F. DUNN, president of the American National Coal Association.

We are still up against the horrible problem of demarcation. Many of us have experience of jobs in this country calling for six tradesmen, whereas the same job abroad can be done efficiently by one.—SIR WILLIAM WALLACE, *chairman and managing director of Brown Bros. & Company, Limited, Edinburgh engineers, and vice-president of the Institute of Marine Engineers.*

Scrap may very well be described as the Teddy-boy commodity of industry. In accordance with the common conception of a Teddy-boy, it appears to have very little regard for rules and regulations, it is very difficult to control, and when it does get entirely out of hand serious disturbances and even general unheaval can easily follow.—MR. W. JAMES, chairman of the National and Midland Ironfounders' Association.

The nations of Europe and North America are faced with the tremendous problem of the so-called underdeveloped countries—ceaselessly claiming our attention, our service, and our money and at the same time adamantly asserting their own authority and independence.—SIR HUGH BEAVER.

Britain holds second place in the "industrial peace league table" and hopes to become champions. It makes me angry to hear people talking about our industrial relations being a national disgrace when only West Germany, of the countries outside the Iron Curtain, has a better record over the past 10 years.—MR. P. H. ST. JOHN WILSON, chief industrial commissioner of the Ministry of Labour.

I would say we are a little too gentlemanly. I do not think we are sufficiently aggressive. We underplay our hand.—MR. W. L. MATHER, *a director of Mather & Platt, Limited, engineers, etc., of Manchester, referring to British salesmanship and publicity.*

Before the war the collieries supplied us with at least three varieties of clean coal 100 per cent. combustible with no danger of flying pieces of bass, whereas nationalized coal is dirty, difficult to light, sometimes containing stone, slate, and other foreign matter . . . . So far as the domestic user is concerned the Coal Board should hide its head in shame.—Letter in the Birmingham Post.

The wearing of suitable footwear, suitable headgear, and the use of eye protection would have prevented perhaps 25,000 *injuries* [*in industrial accidents in* 1958], *that is over a seventh of all reported injuries.*—MR. T. W. MCCULLOUGH, *Chief Inspector of Factories, in an article on "Safety in Industry," in the Financial Times.*

Acquisition by Cooper & Company (Birmingham)

MAKERS of felts and felt fabrications to the motor industry and engineering trades, Cooper & Company (Birmingham), Limited, is to acquire a 50 per cent. interest in Volcrepe, Limited, rubber and foam manufacturers, of Glossop (Derbyshire). Volcrepe will concurrently increase its issued capital from £130,000 to £195,000.

Both are private companies already associated as joint proprietors of Cooper & Company (Foams), Limited. The Volcrepe board will be augmented by Mr. E. F. Bensly, chairman of Cooper & Company (Birmingham), Mr. N. W. Hailey, and Mr. C. A. Lee.

WARNING TO COAL MERCHANTS

Price Increases "Too Many & Too Substantial"

CONCERN at increases in retail coal prices made by merchants was expressed by the National Coal Board's deputy chairman, Sir Joseph Latham, in Birmingham last Friday. They were too many and too substantial, he said, and continuation of this policy could be disastrous to the future of coal in the domestic market.

Sir Joseph gave his warning to coal merchants in the course of a speech to the Birmingham branch of the Coal Trade Benevolent Association in which he disposed of a few fallacies in the public mind about the financial situation of the coal industry.

SIR JOSEPH LATHAM

The deficits of the last two years were entirely attributable to the stocks the board had to carry, he said. A look at the last published accounts for 1958 showed that over the board's first 12 years it earned profits of £200,000,000, swallowed up by payments to the Government in interest and taxation of £232,000,000.

On a comparable basis, the profits of the former colliery owners in the last 12 years before the war amounted only to about £50,000,000, or about one quarter of the board's profits for a similar period of years. Even with allowance made for the change in the price level, that was a very different picture from the allegation of highly profitable private enterprise and highly unprofitable nationalization which was often put forward by some politicians.

Retail Prices

On prices in the coal distributive trade, Sir Joseph Latham said:

"We in the National Coal Board have done everything possible to stabilize the price of coal and we have not increased it for nearly three years, despite the problems of wage increases, stocking costs, and so on. We are very concerned that in some parts of the country since decontrol there have been too many and too substantial increases of retail prices by merchants. The Robson Committee agreed that there was a case for some improvement in retail margins, but I am sure they did not envisage the scale of increases which have been made by some merchants in the last year or two. The continuation of this policy could be disastrous to the future of coal in the domestic market; we believe that in all our markets, price stability is a most important element in our fight to maintain and increase sales."

Answering criticisms of the coal stocks held by the National Coal Board, Sir Joseph said that when the demand for coal began to dwindle the alternatives were clear. The board could adopt the old solutions of wholesale unemployment and short-time working or it could buy time by stocking coal, thus safeguarding the productive capacity of the industry and maintaining the standards of living, not only of those employed in the pits, but of all those trades and industries which were dependent on the board's and the miners' purchasing power. He made no apologies for the policy which had been pursued; he was sure that as the years went by there would be an increasing recognition of the wisdom of what had been done.

"It is suggested that as an industry we are in a state of hopeless decline. We are still struggling with our problems and are going to have many difficult tasks in the years ahead. But figures for the early weeks of this year surely give the lie to the Jeremiahs; in the first eight weeks of this year we have reduced our coal stocks by nearly 3,000,000 tons (quite apart from the run-down of our customers' stocks). This compares with a positive increase of 500,000 tons in the same period last year and is probably the biggest lift of coal stocks in the first eight weeks of the year in the history of the industry. Our disposals of coal to customers in the first eight weeks of the year were 750,000 tons more than in the same period last year, and this surely gives some evidence that the serious downward trend has been arrested."

The latest available figures showed that the percentage of coal miners unemployed in Great Britain was just about 1 per cent., compared with the average of 2 per cent. for industry generally. No one would minimize the effect of unemployment even of a single individual, but the facts did something to correct the scare statements about employment in the industry which were sometimes made. The industry was short of men and anxious to recruit several of the coalfields.

UK Oil Equipment Orders Decline

VALUE of orders for oil equipment won by UK manufacturers has declined for the third year running. The total value last year was £117,200,000 against £122,000,000 in 1958 and the record 1956 figure of more than £153,000,000. During the first nine months of 1959, orders were lower than the previous year, but the total of £34,000,000 in the final quarter was £1,500,000 higher than in the equivalent 1958 period.

Principal categories of orders include tubulars, pipe-fittings and valves, £12,000,000 in 1959 (£14,900,000 a year earlier); automotive equipment, £10,600,000 (£7,500,000); specialized drilling and production equipment, £10,400,000 (almost the same); tools and machinery, £8,700,000 (£4,100,000).

Appointments

Engineering Manager of Hagan Controls

FOR five years—from 1953 to 1958—chief engineer of Fuel Firing, Limited, Reading, Mr. E. F. D. Webb has been appointed engineering manager of Hagan Controls, Limited, London, S.W.1. Mr. Webb was for a time with Merz & McLellan, consulting engineers, where he was responsible for commissioning and installing power transmission and generating plant.

MR. E. F. D. WEBB

He took up his appointment with Hagan Controls after a visit to the US where he investigated American methods of automatic process control. The company, which designs and manufactures automatic control systems for industry, was established last year by the Plessey Company, Limited, Ilford (Essex), in association with Hagan Chemical & Controls, Inc., of Pittsburgh.

Mr. DUNCAN NOWSON has joined the polyethylene division of Union Carbide, Limited, of London, W.1, as staff assistant to Mr. L. E. Whitmore, director of the division.

Mr. T. E. SIMMS has become chief project engineer of the English Electric Company, Limited. He is succeeded as chief sales engineer at the company's aircraft equipment division at Bradford, by Mr. DOUGLAS LANG.

Mr. A. MARKHAM, who in 1957 joined the Peterborough diesel engine firm of F. Perkins, Limited, as production control manager, has been appointed its manufacturing manager. He was for 16 years with Girling, Limited.

Mr. R. E. LEACH, who has joined the Plessey Company, Limited, Ilford (Essex), as regional personnel manager for the Swindon area, was formerly with Bristol Aero Engines, Limited, and the guided weapon division of the Sperry Gyroscope Company, Limited.

After four years as deputy manager of the Warsop Colliery, near Mansfield (Notts), Mr. JAMES KERR has been appointed manager of Harworth Main Colliery (Yorks), where he takes over from Mr. Fergus McNeill, who is leaving for India to become assistant chief mining engineer with a British company.

Mr. R. F. MCCORMICK has been appointed regional sales manager (explosives) for the northern region of Imperial Chemical Industries, Limited, as from March 1. As a member of the technical service department of the Nobel Division of ICI, Mr. McCormick became recognized as an authority upon explosives utilization in various fields of application. He has published many technical papers and has become widely known in European mining circles.

New director of the Harlow research laboratory of Associated Electrical Industries, Limited, is Dr. M. E. HAINE. He succeeds Dr. G. W. Sutton, who has retired, but is continuing in a consultative capacity until May. Dr. Haine, formerly manager of Harlow research laboratories, spent several months in the United States in 1945, working on the atomic bomb project. He was appointed consultant to the Siemens Edison Swan, Limited, research laboratory at Harlow in 1956.

Mr. WILLIAM GERARD BRYCE has been appointed general manager of Heyes & Company, Limited, electrical engineers, etc., of Wigan (Lancs), with effect from April 1. He has been manager of transformer sales of C. A. Parsons & Company, Limited, and production engineer of A. Reyrolle & Company, Limited, and for two years was industrial engineer responsible for investigating projects of British Insulated Callender's Cables, Limited.

Mr. J. R. COTTERILL has been appointed manager of the outside services department at the Witton Works of the General Electric Company, Limited, a new department formed to co-ordinate erection, commissioning, and post-commissioning service of electrical plant. Mr. Cotterill started his career at Witton, and was promoted to chief inspector in 1949. Six years later he was appointed manager of the engineering works concerned with the manufacture of electrical rotating plant.

Mr. A. T. ST. J. W. SHUTTLEWORTH has been appointed chief information officer of the Federation of British Industries following the resignation of Mr. A. Liddell Hart. Mr. Shuttleworth, who first represented the FBI in India, played an important part in the formation of the mission headed by Sir Eric Coates, which went to India in 1956 "to advise on the further expansion of heavy machinery manufacturing capacity during the period of the second five-year plan." He has since done considerable work in developing the federation's Commonwealth and Far Eastern public relations.

US Steel Corporation Income Affected by Strike

FULL cost of the steelworker's hour of work for the United States Steel Corporation had grown by 1959 to be a "startling" 65 per cent. greater than the so-called average basic wage rate he received, according to the corporation's annual report. "The rapid growth of the so-called 'fringes' has made wage rates completely inadequate as an indication of the cost of an hour's work," the report continues.

The US steel strike adversely affected the company's income, which was down to $254,500,000, or 7 per cent. on sales of $3,643,000,000, compared with income of $301,500,000 or 8.7 per cent. on sales of $3,472,100,000 in 1958. Expenditures for additions and replacements were $366,100,000 in 1959 compared with $448,100,000 in 1958. The amount required to complete all authorized projects was estimated at $695,000,000 compared with $730,000,000 at the close of 1958.

The report emphasizes the corporation's research and development activities to meet the challenge of domestic and foreign competing materials. Notable progress was achieved in the improvement and further development of high-strength and alloy steels for a wide variety of uses, including missile and nuclear applications.

FAIREY ENGINEERING COMPANY, LIMITED—Mr. L. R. E. Appleton has been appointed managing director and Mr. P. J. Duncton, a director of the company, has been appointed general manager at the new head office at Heston.

Law Cases

APPEAL COURT RULING

Colliery Compensation and Profits Tax

DECISION of Mr. Justice (now Lord Justice) Upjohn and the Special Tax Commissioners that Henry Briggs, Son & Company, Limited, Whitwood Collieries, near Normanton (Yorks), is liable for profits tax on dividends received from its subsidiary, Briggs Collieries, Limited, since the nationalization of the coal industry in 1946, has been upheld by the Court of Appeal. The parent company had appealed against profits tax assessments for January, 1947, to July, 1951, when it went into voluntary liquidation.

The Master of the Rolls (Lord Evershed) said that after nationalization, the efforts of Briggs Collieries were devoted to ascertaining the compensation payable under the Coal Acts. Dividends paid to the parent company came under the nationalization legislation, and Briggs Collieries could not be said to be carrying on business.

In certain circumstances income received by the parent company would be treated as "franked investment income" and under provisions of the Finance Acts would not be taken into account for profits tax assessment. These dividends did not come within that category.

Lords Justices Pearce and Harman agreed, and the appeal was dismissed, with costs. Leave to appeal to the House of Lords was refused.

Judge Criticizes Union's "Shocking Dilatoriness"

REFERENCE was made by Mr. Justice Salmon at Leeds Assizes to "the most shocking dilatoriness" of the trade union acting for a widow who was suing the National Coal Board for damages in respect of the death of her husband at Horton Main Colliery in Januuary, 1954.

Dismissing the claim by the widow, Mrs. Edith Williams, the judge said he had the greatest sympathy with her, but was unable to give her a penny on that count. He was unable on the evidence to find the Coal Board had been in breach of duty.

The judge was told that her husband, Mr. John Williams, had been knocked down a shaft by a tub which over-ran a catch. Giving judgment with costs for the NCB, he spoke of the delay in the case. Much of it, the judge went on, was due to the most shocking dilatoriness on the part of the union.

The writ was not issued until almost a year after the accident and the statement of claim was not delivered until June, 1957. It was an added difficulty, he said, that the accident happened so long ago, because witnesses' recollections tended to fail. In a case like this, where a plaintiff succeeded and needed the money, the money was kept from the plaintiff by the delay.

Mr. Justice Salmon continued: "I hope I am not unsympathetic to the difficulties which beset unions in these circumstances. One cannot expect them to rush into litigation, but after liability had been repudiated by the Coal Board in the plainest possible terms, to wait more than three years before delivering the statement of claim seems to me to take a good deal of explaining and no explanation has been forthcoming."

Mining Company Revived on Tax Petition

PETITION to revive Bairds & Dalmellington, Limited, coal owners, of Glasgow, was granted in the absence of opposition by Lord Walker in the Court of Session. The company was dissolved after its assets had been vested in the National Coal Board under nationalization in 1946. The petition, intimated earlier this month, was in the name of Mr. James McCreath, liquidator of the company, and follows a decision last year in the House of Lords affecting tax deductions.

The company received from the Ministry of Fuel and Power between vesting date and February 4, 1955, interest and revenue payments under the provisions of the Coal Industry Nationalization Act amounting to £1,175,777. Sums totalling £535,779 were deducted from these payments by the Ministry for income tax and the balance was distributed to members of the company.

After a House of Lords decision in the case of Whitworth Park Coal Company, Limited, *v.* the Commissioners of Inland Revenue, the petitioner now believed that the Ministry was not entitled to make deductions and that the sums deducted were now recoverable. He asked that the dissolution of the company be declared void so that the money might be recovered. Lord Walker was told that no answers had been lodged and thus granted the petition.

"EXTRAORDINARY ACCIDENT"

FOUNDRY dresser whose leg was seriously injured in what Mr. Justice Davies described as "a most extraordinary accident" at work failed at Stafford Assizes in an action for damages against Shelton Iron & Steel, Limited, pig-iron and finished-steel makers, etc., of Stoke-on-Trent.

The judge said that the plaintiff, Mr. Ernest Willett, of Abbey Hulton, who was assisting another workman to move parts of a stove-pot on a two-wheeled barrow, was pulling on a rope at the front up a slight incline. The accident happened on the fourth journey. While they were at the fitting shop a 1¼-in. diameter compressed air pipe was laid across the yard and Mr. Willett, who was facing the barrow, failed to notice it.

As the wheels of the barrow crossed the pipe the 3½-cwt. casting fell off, and injured the plaintiff's right leg.

"How in the world it came to happen I do not know," said the judge. One would not have thought that a barrow of that kind, with pneumatic tyres, could possibly lose its load by crossing over a 1½-in. pipe. The judge said the claim must fail because he could not find that the pipe was a dangerous obstruction nor that Mr. Willett's fellow workman was negligent in not warning him about it.

OIL ESCAPE IN RIVER

FINE of £50 with 50 guineas costs was imposed at Middlesbrough on Dorman, Long & Company, Limited, for allowing a mixture of oil and water to be discharged from Acklam works into the River Tees—an offence under the Oil in Navigable Water Act. The company pleaded Not Guilty.

Prosecuting, Mr. A. R. Tate said that industrialists and shipping concerns had several times been warned to take the utmost care to prevent oil getting into the water. Oil pollution was not only a nuisance by fouling ships, river banks, wharves, and beaches, but also brought a serious fire hazard, he said.

Mr. J. W. Carr, works manager, said inquiries revealed that a valve had been left open, and that a flange inside a pipe had been removed. The company were unable to trace those responsible, but he claimed that all reasonable precautions had been taken. Since this incident, when about 50 gallons of oil escaped, the pipe had been redirected to lead away from the river.

TRAINEE WAS CRUSHED

INJURIES received by a young engineer-trainee in a works accident were so extensive that it was a wonder he was alive, Mr. Justice Davies was told at Stafford Assizes. The trainee, Mr. Brian James Gardner (19), received £6,500 in settlement of an action for damages against his employers, William Boulton, Limited, engineers and ironfounders, of Burslem.

Mr. E. Ryder Richardson, QC, said that Mr. Gardner was crushed by an object weighing about a ton when part of a lifting apparatus broke. He had been left with a paralyzed and almost useless left lower leg. Other injuries included a broken spine, and it was thought he might have increasing incapacity in his back as he grew older.

Counsel said that the employers had expressed their intention to keep Mr. Gardner in work. The company had given him clerical work, and was helping him to improve his position.

PIT CONTRABAND FINE

MINER who admitted having part of a cigarette in his possession underground at Overtown Colliery (Lanarkshire) was at Hamilton Sheriff Court fined £6 with the alternative of 30 days' imprisonment. The fiscal said that during a search of the men, a deputy found a partly-smoked cigarette on the accused, William Stewart Brown (41). He would lose his job as a result of the offence.

The fiscal explained that a shotfirer at the colliery reported to a deputy underground in the early hours of the morning that he thought someone had been smoking at a point where Brown and other men were working.

THUMB INJURY CLAIM FAILS

AUTO machine setter who lost the tip of his left thumb when it was caught in a machine at work, admitted at Newcastle-under-Lyme (Staffs) County Court that the accident was his own fault. The plaintiff, Mr. Stanley Cartlidge (39), failed in his claim for damages against his employers, the British Thomson-Houston Company, Limited.

It was stated that the fencing around the machine was removed for a minor repair. Mr. Cartlidge had his hand in the works and accidentally restarted the machine. The plaintiff denied that he was grossly careless, but agreed that the accident was his own fault. When he started to make the repair his attention was distracted by a workmate speaking to him.

Judge H. A. Tucker found that defendants had not been guilty of a breach of statutory regulations regarding the fencing of the machine on which Mr. Cartlidge was working.

£2,120 FOR EYE INJURY

SHIPWRIGHT whose right eye was badly injured in a shipyard accident was awarded £2,120 damages by a jury sitting with Lord Wheatley in the Court of Session, Edinburgh. The plaintiff, Mr. David Wallace, of Glasgow, sued his employers, Alexander Stephen & Sons, Limited, shipbuilders.

It was stated that Mr. Wallace was bolting galvanized steel straps on to a bulkhead and that this involved using bolts which passed through holes already made. Because of a strike, the holes had been roughly made, and Mr. Wallace said he had difficulty in aligning one of the straps. He tapped it with his hammer and as he did so a piece of metal flew off and entered his eye. The defendants claimed that Mr. Wallace should have taken the obvious precaution of turning his head away before striking the strap.

MAN "MOROSE" AFTER ACCIDENT

DAMAGES of £1,250 were awarded at Leeds Assizes to a steel erector who, said Mr. Justice Salmon, changed from a cheerful man of great initiative into an obsessive worrier, morose, and bad tempered, after an accident in which a falling steel plate hit him on the head. The plaintiff, Mr. George Ackroyd (39), of Dewsbury, sued his employers, Bennis Combustion, Limited, of Manchester, and another firm, Aiton & Company, Limited, of Derby.

It was stated that the two companies were carrying out work at Huddersfield power station in January, 1956, when the accident occurred. Both defendants admitted liability.

FOR RECEIVING two stolen lead ingots, Ronald Tutton (34), scrap metal dealer, was fined £50 at Newport (Mon) Magistrates' Court. The metal was found under a pile of rags at his yard. Tutton, who denied the offence, said he did not attempt to hide the ingots because he did not know they were there.

COLLIERY CONVEYOR SHIFTER who admitted, through an agent, having a box containing four cigarettes and ten matches underground at Lochhead Colliery, Coaltown of Wemyss (Fife), was fined £15 at Kirkcaldy Sheriff Court. The fiscal said that the accused, James Elder Rodger (22), was dismissed when the contraband was found in his trouser pocket.

MAINTENANCE ENGINEER who lost part of a finger in a works accident was awarded £548 9s. damages at Staffordshire Assizes, against George Matthews & Company (Cradley), Limited, makers of sheet metal pressings. It was stated that the plaintiff, Mr. Samuel Charles Grove, of Cradley, was adjusting a clutch on a power press, when a guard was lowered and trapped his finger. Mr. Justice Davies said there was no contributory negligence by the plaintiff.

European Steel

FEBRUARY OUTPUT NEARS RECORD LEVEL

OUTPUT of crude steel (ingots and castings) in the European Coal and Steel Community in February continued at a high annual rate of more than 70,000,000 tons. Provisional figures published by the High Authority placed February output at 5,902,000 tons, against 5,896,000 in January and 4,496,000 in February last year. Last month's total was again just short of the record level of last October.

February output of pig-iron and ferro-alloys was 4,331,000 tons, just short of the record output of 4,416,000 tons in January, but substantially higher than the 3,330,000 tons in February last year.

Western Germany's contribution to the raw steel total last month was 2,773,000 tons, an increase of about 3,000 tons on the January figure, despite the shorter month. The February figure represented a daily production increase of 3.8 per cent. Production of pig-iron per working day increased by 5.1 per cent. in February, even though the total of 2,059,000 was 35,000 tons below the January figure.

West German Export Setback

Export orders for West German steel have received a setback, although home and domestic orders are adequate to keep the big works busy for some months. Rolled products, including special steels, totalling a little more than 1,800,000 tons, were ordered in February, compared with 1,940,000 tons in October last year.

The export market is believed to have been affected by the fact that demand pent-up by the US steel strike last year has not proved as great as expected.

The leading Ruhr concern, August Thyssenhütte, is planning to take over 51 per cent. of the nominal capital of Phoenix Rheinrohr to create Europe's largest steelmaking unit. Approval must first be granted by the High Authority of the ECSC, which has power to forbid mergers giving any concern domination over the Community's market. ATH is the only remaining German company in Miferma, a Franco-British-German project to exploit iron-ore deposits in French West Africa. In addition ATH also has a 30 per cent. stake in a major German producer of sheet, Hüttenwerke Siegerland, control over which is sought by Dortmund, Hörder-Union.

The Austrian iron and steel manufacturer, St. Egyden Eisen- und Stahlindustrie Gesellschaft has informed the Austrian Government of its intention to raise issued capital from 6,000.000 schilling (£75,000) to 18,000,000 schilling (£225,000).

From Russia it is reported that the world's largest blast furnace is to be built at the new iron and steel centre east of the Ural Mountains. It will measure 95,350 cub. ft.

A VERDICT of Accidental Death was returned at a Newport inquest on Mr. Arthur Henry Betts (62), a fitter, who died from injuries he received after being struck by a dumper scoop while working in the foundry at the Cwmbran (Mon) works of Guest, Keen & Nettlefolds (Cwmbran), Limited.

Electric Transporters in New P&O Liner

TWO specially designed transporters for loading and unloading cargo in the new P&O liner Canberra are being made by the Carron Company, of Falkirk. The hoisting and traversing mechanisms are housed in a moving carriage on a boom and the transporters will be able to handle every kind of load.

Fully-guarded overhead current collection equipment for these transporters is being supplied by British Insulated Callender's Cables, Limited. This equipment ensures that all current-carrying parts of the conductor system are adequately insulated and that the bare conductors are enclosed. The Canberra is now under construction at the Belfast shipyard of Harland & Wolff, Limited.

BICC has also announced an order received from Lisbon Electric Tramways for the supply and installation of 9,750 yards of 33 kV 3-core pressure cable and 9 km. of twin telephone cable and accessories for a link between the Portuguese CNE substation at Moscavide and the Lisbon Electric Tramways substation at Arco do Cego. This is a further link in the Santos-Xabregas-Moscavide route, for which BICC supplied and installed cables in 1955. Installation is expected to begin in May.

Mr. K. L. Stretch Appointed to Technology College Post

MR. K. L. STRETCH, director of the Central Engineering Establishment of the National Coal Board, at Bretby, near Burton-on-Trent, has been appointed vice-principal of the College of Advanced Technology, Birmingham, from June 1, 1960. Mr. Stretch, who is 42, graduated in mathematics at King's College, Cambridge, and served an engineering apprenticeship with Mather & Platt, Limited, of Manchester. He gained experience in the works and in design with Imperial Chemical Industries, Limited, and then became works manager for the UK Atomic Energy Authority, Calder Hall. He took up his present post in 1957.

During his career, Mr. Stretch has undertaken research and development in fire and textile engineering, nuclear reactor characteristics and operation, tunnelling and non-destructive testing, and has written articles on nuclear energy and fuel policy. Mr. Stretch is also a barrister.

Coal-mining Outlook "Not Dispiriting"

"OUTLOOK for the coal mining industry is not at all dispiriting," said Mr. Noel Gee, staff director of the East Midlands Divisional Coal Board, speaking at the annual dinner-dance of Chesterfield College of Technology Mining Society last week.

MR. NOEL GEE.

Mr. Gee spoke of the tremendous amount of reconstruction work—"unequalled in this country"—and the great improvements in mining techniques, safety, working conditions, and employees' welfare. Referring to the increased efficiency of the latter half of last year, he reported that output per manshift had risen by about 7 cwt.

Mr. Gee stressed that the industry offered excellent facilities for training, education, and even further education, and called for close liaison between the industry and technical colleges. "The Coal Board knows its responsibilities and you can be sure will remember them," he added.

Mr. G. Inverarity, production manager of No. 1 (Bolsover) Area of the division, and president of the college's mining society, spoke of the industry's "bad times" in the past few months. "Many of us thought that future prospects were not very bright. The position will change, and I can assure you that the young engineer of today need have no fears. Never has the need for hard-working ambitious young men been greater," he said.

Others present included Mr. E. Cardwell, principal of the college; Mr. J. B. Hall, divisional mechanical engineer; Mr. D. McLuckie, divisional strata control engineer; Mr. D. A. Smale, No. 1 Area chief scientist; and Mr. L. E. Fletcher, manager of Whitwell Colliery.

Fire Risk and Coal: NCB Refutes Claim for Oil Heaters

STATEMENT has been issued by the National Coal Board in reply to remarks attributed to Mr. A. V. Launder, of the Oil Appliance Manufacturers' Association, that domestic oil heaters cause fewer accidents than do other forms of home heating. It reads:

"The only official statistics on this subject are those given in the fire research report published by HMSO for the Department of Scientific and Industrial Research and the Fire Offices Committee. The official interpretation in the 1958 report is, in fact, that oil is three times as dangerous as coal—the fuel most widely used in the home. This information has been brought to the notice of the Oil Appliance Manufacturers' Association on a previous occasion when its spokesman made claims similar to Mr. Launder's."

JOHN WALLACE & SONS, LIMITED—Mr. R. E. Silletto has resigned from the board.

Runner-up Ineligible for NUM Presidency

RUNNER-UP in the ballot for the presidency of the National Union of Mineworkers is too old by a few days to be eligible to compete in the new ballot for the appointment. Mr. William Allen, finance secretary of the Northumberland Area, is precluded under union rules because he will be over 60 on July 1, when the result of the new poll will be announced.

The second ballot is caused by the death of Mr. Alwyn Machen, Yorkshire NUM president, a few days before it was revealed that he had topped the poll for the national presidency with 254,675 votes. Mr. Allen secured 158,974 votes.

The count is conducted under a system of proportional representation, whereby unsuccessful candidates are eliminated and second preferences are added to leading candidates. Before this process began, the voting was: Mr. Machen, 176,174; Mr. Allen, 107,942; Mr. J. Southall (Midlands Area secretary), 65,378; Mr. J. Hammond (Lancashire Area agent), 45,782; Mr. H. W. Wynn (Derbyshire Area secretary), 31,888.

"OPPORTUNITIES FOR YOU ALL," MINING STUDENTS TOLD

PAST and present students of the Wigan and District Mining and Technical College were told last Friday by Col. G. G. H. Bolton, chairman of the North-Western Divisional Coal Board: "Don't get depressed about the industry in its present situation. I am convinced there is ample opportunity for you all." Col. Bolton, who was speaking at the annual dinner-dance of the Past and Present Mining Students' Association, urged members to take advantage of every available facility.

The guests were welcomed by Mr. T. J. Sales, divisional marketing director, and, responding, Mr. R. H. Clough, Divisional Inspector of Mines and a former pupil at the college, said: "There is still a very great need for the efforts, the prowess, and knowledge that a college like Wigan can give and for the contribution it can make towards the technological advance of the industry."

Runaway Tubs Killed Colliery Surveyor

TWO runaway tubs killed a colliery surveyor underground at Lochhead Colliery (Fife), a Kirkcaldy inquest was told. A formal verdict was returned on Mr. William Watt Smellie (34), who died in hospital a few hours after the accident.

Mr. John Taylor Pirrie (17), oncost worker, said he was responsible for attaching the haulage rope to the loaded tubs at the bottom of the section. A safety block across the rails to prevent tubs from running down the slope had been pushed into the "off" position by two empty tubs coming up the haulageway. When two loaded tubs began to run away, Mr. Pirrie caught hold of the first, but fell and had to let go when the second one struck him in the back.

WARSOP POWER TOOLS, LIMITED—Mr. F. W. Hodges has been appointed to the board as managing director.

GAS ROASTING OF PELLETS

Experiments in a Soviet Vertical-Shaft Furnace

By I. I. ROVENSKII

The author, who is at the Mekhanobrchermet Institute, in the Soviet Union, has carried out experiments in roasting self-fluxing pellets in a vertical-shaft furnace, whereby gas combustion occurs within the body of charge by means of multi-jet tubular burners. The author, who was assisted by N. N. Berezhnoi, found that self-fluxing pellets could be satisfactorily and more economically produced, but the topmost layer of the charge had a tendency to uneven roasting and disintegration. A report of the investigations appeared in Metallurg, 1959, No. 9.

ROASTING of pellets under commercial conditions is carried out abroad in shaft furnaces or on strand machines of the type used for sinter. The diameter of shaft furnaces, as a rule, does not exceed 1.8 m., a further increase in their size not being feasible, since this brings about very large fluctuations in temperature in a charge of pellets being roasted. Even in furnaces with a diameter of 1.8 m. these fluctuations to some extent cause local zones of overheating, leading to agglomeration of the material into lumps.

Special difficulties can be experienced in roasting self-fluxing pellets in a shaft furnace, and these have not yet been overcome, since the narrow range of softening and fusion temperatures of the mixture of concentrate and flux demands the maintenance of strictly controlled operating temperature. Very slight overheating of the pellets leads to extensive fusion with each other, which sharply reduces the gas permeability of the charge.

In the USSR, where all blast furnaces are operating on self-fluxing agglomerate or sinter, the production of self-fluxing pellets is important. It is easier to achieve this on strand sinter machines than in shaft furnaces. The roasting of pellets on a furnace grate is possible by combustion of solid-fuel particles rolled into the surface of the pellets, by heating the charge with gas combustion products, combustion taking place above the charge, or by the combustion of gas from the charge itself.

The first method has been studied and developed most abroad. By this method of roasting, pellets are produced with satisfactory strength, but with a high content of FeO (16-18 per cent.), and are difficult to reduce. The second method which has been developed by the firm of Lurgi, makes it possible to maintain any atmosphere in the layer of pellets (oxidizing, reducing or neutral), and consequently obtain a product of the required quality. If gas of high calorific value is used for this roasting, and during experiments at the Mekhanobrchermet Institute a mixture of propane and butane was used with a calorific value of 25.000 kcal./cub. m., or a liquid fuel, then it is possible to arrange for combustion to take place with a large excess of air to create the necessary oxidizing atmosphere for producing well oxidized and easily reducible pellets.

In the experiments the quantity of free oxygen in the waste gases reached 7 to 8 per cent., and the FeO content of the pellets 1.6 to 3.6 per cent. The reducibility of the pellets obtained was approximately 50 per cent. greater than the product obtained by the first method.

The disadvantage of the second method is the high fuel consumption, since during roasting it is necessary to heat the whole layer of pellets at the same time, while during operation by the first method the combustion zone, just as during sintering, moves from the top downwards, and has a relatively small thickness.

Lurgi Method of Roasting

It is shown to be beneficial to carry out combustion of a gas in such a way that combustion would take place within a narrow layer of pellets which

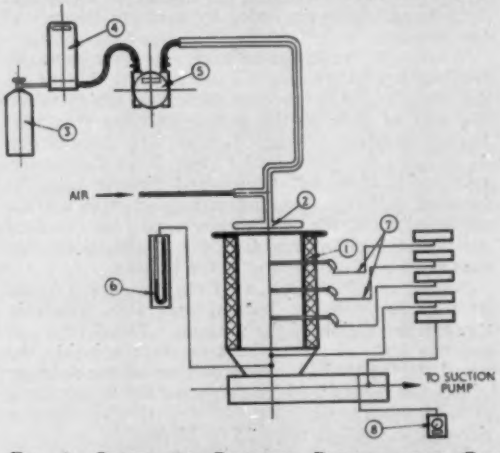


FIG. 1.—PLANT FOR ROASTING PELLETS WITH GAS COMBUSTION IN THE CHARGE.

1. Vessel; 2. Burner; 3. Gas cylinder; 4. Rheometer; 5. Gas meter; 6. Suction gauge; 7. Thermocouples; 8. Waste gas meter.

TABLE 1.—*Roasting Indices for Pellets Produced by Gas Combustion Within the Charge.*

Basicity of pellets.	Gas consumption, litres.	Duration, min.				Vertical rate of roasting, mm./min.	Maximum vacuum pressure mm. water column.	Yield of +5 mm. fraction after dropping, per cent.	Crushing load, kg.	Drum test, per cent.	FeO content, per cent.
		Drying and heating.‡	Roasting.	Cooling.	Total.						
—	710†	12	14	3	29	15.6	770	88	170	19	3.3
0.7	550† 720*	13	13	3	29	15.6	600	84	170	12	3.3
0.85	770*	12	19	3	34	13.0	650	75	160	12	3.0
1.0	750*	14	16	3	33	13.5	450	70	170	17	2.5

* Pellets fluxed with chalk.
† Pellets fluxed with lime.
‡ The duration of this stage of the experiment is taken to be the time until the flame breaks away from the burner and gas combustion commences within the charge of pellets.

would move from the top downwards. This may be achieved, if a mixture of gas and air is made to flow at a high velocity from the apertures of a burner. Pellets were roasted in a steel vessel 450 mm. high by 210 mm. dia. lined, covered on the outside with chamotte powder and sheet asbestos, the overall thickness of the lining being 25 mm.

On top of the vessel was placed a multi-jet tubular gas burner, into which gas was delivered from cylinders, and air from a compressor. The plant was provided with the necessary control measurement instruments. A diagram of the plant is shown in Fig. 1. The combustion products were drawn off by a suction pump with a water seal.

Pellets were charged into the vessel in a layer 400 mm. deep. Before roasting they were dried for a period of from 3 to 5 min., with the burner placed at a height of from 150 to 200 mm. above the layer of pellets, in order that the flame should not come into contact with the surface of the moist pellets, and so cause disintegration. After drying, the burner was placed at a distance of about 50 mm. above the layer of pellets. Then the top layer of pellets was heated to roasting temperature (1,200 to 1,300 deg. C.). The junctions of three thermocouples were embedded in the middle of the pellets at different levels in order to measure the actual temperature.

When the reading of the top thermocouple reached 800 to 900 deg. C. the consumption of air delivered to the burner was increased, which raised the rate of flow of the gas-air mixture from the burner nozzles. When the gas flow approached 40 m./sec., the flame broke away from the burner, and combustion was transferred directly into the layer of pellets. Roasting proceeded with surface combustion of the gas within a narrow layer of pellets, in such a way that the combustion zone moved down from the top to the bottom.

Air for combustion, apart from that which found its way through the burner, was also drawn in through the action of the vacuum. The delivery of gas was cut off when the temperature inside the vessel started to fall. After cutting off the delivery of gas the pellets were cooled until the temperature in the bottom layer fell to 800 deg. C. The dimensions of the pellets were 15 to 25 mm.

In the plant unfluxed pellets were roasted, and also pellets fluxed to a basicity of 0.7, 0.85, and 1. According to the quantity of waste gases and the consumption of gas, a calculation was made of the coefficient of air consumption per minute. The roasted pellets were tested for crushing strength on a lever press and for strength in a P.G. Rubin drum. The results of roasting are presented in Table 1.

Production of Unfluxed Pellets

Pellets produced on a pelletizing disc, were charged without additions of any kind into the vessel and the burner ignited above them. At the start of the experiment the total air consumption coefficient was between 1.3 and 1.5, taking into account the air sucked in between the nozzles of the burner. The rate of flow of the gas-air mixture out of the burner amounted at this stage to from 10 to 15 m/sec. Under such working conditions drying and heating of the top layer of pellets was carried out. Then the consumption of air delivered to the burner and the suction under the bottom grate were increased. The air consumption coefficient rose sharply, and during the course of 2 to 3 min. attained 2.0 to 2.5. The flame broke away from the burner.

On establishing combustion within the layer of

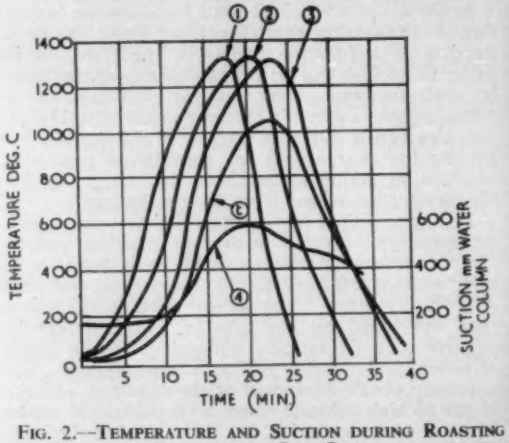


FIG. 2.—TEMPERATURE AND SUCTION DURING ROASTING OF UNFLUXED PELLETS BY GAS COMBUSTION WITHIN THE CHARGE.

1, 2, and 3—Temperature at distances of 300, 200, and 100 mm., respectively, from the bottom grate; 4—Suction.

pellets, the quantity by weight of the gases passing through the layer was reduced due to the increase in the volume of the combustion products connected with the thermal expansion of the gases. Therefore, the suction under the bottom grate increased, while the quantity of air sucked in was reduced and the air consumption coefficient fell to between 1.5 and 1.6.

The change in the temperatures in the charge of pellets and of the waste gases and the change in the suction head are shown in Fig. 2, from which it may be seen that the thermocouples in the lower layers of the charge of pellets show a somewhat lower temperature than the maximum temperature in the top layer. But at a constant coefficient of air consumption it should be the other way round, since the gas-air mixture passes through into the lower levels in a preheated state. The lower temperatures in the lower part of the vessel are explained by the need to increase the rate of extraction of the gases, and consequently the quantity of air drawn in, in order to hasten the movement of the combustion zone in the charge of pellets.

A drum test of the pellets produced gave a figure of 19 per cent., and the crushing load was 170 kg. The yield of pellets of +5 mm. after dropping from a height of 2 m. amounted to 88 per cent.

Production of Self-fluxing Pellets

After drying and heating the self-fluxing pellets, their top layer showed a high degree of disintegration owing to the separation of the hydrate water, if lime is used, or of CO_2, if limestone or chalk is used.

It should be noted that pellets which are fluxed with lime are more subject to disintegration during heating than those fluxed with limestone or chalk. This is explained by the lower temperature and lesser heat of dissociation of $Ca(OH)_2$ by comparison with $CaCO_3$.

On increasing the heating rate for the unfluxed pellets there was only slight disintegration of the pellets in the top layer, while during heating of the self-fluxing pellets, even at a slow rate, especially at a basicity equal to one, there was disintegration of a layer of two or three pellets. More fines were produced than during the roasting of unfluxed pellets, so that the even distribution of the gas over the cross-section of the vessel was upset; in some areas the pellets fused together and were agglomerated into a solid mass, while in other areas, to which little of the gas-air mixture penetrated, the pellets were not roasted at all.

The maximum suction during the roasting of the self-fluxing pellets is frequently lower than during the roasting of the unfluxed, since at a higher suction, when the gas permeability of the layer is low, even roasting over the cross-section of the vessel is not obtained, and the experiments are unsuccessful.

The drum test of self-fluxing pellets is better than that of unfluxed, but the yield of the +5-mm. fraction after dropping is considerably lower and falls with the increase in the basicity.

For roasting a ton of moist pellets by gas combustion in the layer of pellets, approximately the same amount of heat is consumed as during roasting with a solid fuel, and 33 to 50 per cent. less than during roasting with combustion of a gas above the charge. The quality of the resultant product is better than during roasting with a solid fuel.

The experiments which were conducted showed that it is possible to carry out roasting of pellets by gas combustion within the charge. During such roasting the top layer of pellets is often less satisfactorily roasted than the lower layers. It is, therefore, beneficial to carry out a combined process of roasting; first of all the top layer of pellets is heated with gas combustion above the charge under special ignition hoods, and then the layers of pellets lying further down are roasted by gas combustion within the body of the charge. This makes it possible to achieve slow drying and heating, and at the same time roasting of the layers of the charge lying further down will take place with a lower consumption of fuel than during roasting by combustion of the gas above the charge.

It is intended to introduce such a process of gas roasting in an YuGOK industrial pilot plant. Drying of the whole charge and roasting of its top layer will be carried out by gas combustion under ignition hoods above the charge of pellets, and the subsequent roasting of the lower layers of the charge by means of the multi-jet tubular burners which have been developed by the Mekhanobrchermet Institute.

UNIVERSITY LECTURES IN METALLURGY

A COURSE of three lectures by Prof. R. Schuhmann, Professor of Metallurgical Engineering, Purdue University, USA, is to be given at the Imperial College of Science and Technology, Royal School of Mines (Metallurgy Lecture Theatre), Prince Consort Road, London, S.W.7, on April 26 and 27.

The lectures cover "The Role of the Engineering Sciences in Engineering Education," "Metallurgy, Materials Sciences, and Engineering," and "The Anatomy of Extractive Metallurgy." The chair at the first lecture will be taken by Prof. F. D. Richardson, Professor of Extraction Metallurgy in the University of London.

The course is addressed to students of the university and to others interested, admission being free (without ticket).

Angus Gear Book

Compiled with the objective of providing information on all aspects of gears and gear-cutting, a valuable textbook is now available from George Angus & Company, Limited, Westgate Road, Newcastle-upon-Tyne 1. The contents include sections on spur, single helical and double helical gears; bevel, internal, spiral, and worm gears. Other sections cover gear materials; gear tooth loading; load carrying capacity, and gear failure. The book contains over 170 pages of text, tables, diagrams, and other useful illustrations, which should be helpful to both engineers and students. The cost of the book is 7s. 6d.

Iron and Steel Institute

Special Meeting in Italy

INCLUDED in the programme for the Iron and Steel Institute's special meeting in Italy (May 29 to June 11) is a joint meeting with the Associazione Italiana di Metallurgia, the president (Prof. Felice De Carli) and council of which will present the Giolitti Medal to the institute's president, Mr. W. F. Cartwright. The joint meeting, on May 30 and 31, will be held in Milan.

The special meeting will be in three sections, the first of which (May 29-June 4) will include the joint meeting with the Associazione Italiana di Metallurgia and visits to works in Milan, Turin, Aosta, and Genoa. The second section (June 4-8), which will be in Rome, will include a visit to the works at Terni in addition to sightseeing excursions in and around Rome. Naples will be the centre for the third section (June 8-11), which will include a visit to the Ilva Bagnoli works as well as alternative visits to Capri, Pompeii, and Sorrento.

A special excursion, as an alternative to the third section, will leave Rome on June 8, travel by bus via Assisi and Perugia to Florence, and remain there until the morning of June 11.

Four papers will be presented at the two technical sessions of the joint meeting. They will be presented in Italian, simultaneous translation facilities into English being available. Contributors to the discussions will be able to speak in English. The papers are:—"New Processes for the Reduction of Iron Ores," by Prof. A. Scortecci and Dr. A. Palazzi; "Melting Trials in Electric and Open-hearth Furnaces on Ferrous Material Produced by Direct Reduction Process," by Prof. O. Masi; "Continuous Casting of Steel," by Prof. M. Signora, and "Vacuum Casting of Steel," by Mr. V. Scalise.

Luncheon on the first day, by invitation of the associazione, will be in the Museum of Science and Technology. In the evening there will be a reception and cocktail party at the Villa di Via Palestre by invitation of the Lord Mayor of Milan. The associazione is giving a banquet on the second evening at the Hotel Principe di Savoia, Milan.

A full programme of works visits and social events has been arranged for the remainder of the special meeting.

Specifications for Steel Castings

Published recently by the British Steel Castings Research Association, "British and Foreign Specifications for Steel Castings" (Part 1) summarizes the requirements of national standards for steel castings issued in many countries, and indicates the nearest comparable British Standard Specifications. The guide covers Austria, Belgium, France, West Germany, East Germany, Great Britain, Sweden, Switzerland, and the US. In addition, lists of standards current in Czechoslovakia, Holland, and Italy are provided. Part 2 of this publication, to be issued at a later date, will include the Commonwealth countries and additional foreign countries.

FORTHCOMING EVENTS

MARCH 22

Combustion Engineering Association (Scotland): Meeting in Glasgow: "Industrial Use of Gas," and "Problems of the Packaged Boiler."

MARCH 23

Institute of Fuel: Meeting at the Institution of Civil Engineers, Great George Street, London, S.W.1, at 5.30 p.m.: "New Process for Briquetting Coal without a Binder," by H. R. Gregory.

MARCH 24

Coke Oven Managers' Association (Northern Section): Meeting at the Three Tuns Hotel, Durham, at 7 p.m.: "Elimination of Dust and Drizzle from Quenching Towers," by E. R. Waple, W. C. Ingleby, and R. Jackson.

MARCH 28

Institution of Electrical Engineers (East Anglian Sub-centre): Meeting at the Assembly House, Norwich, at 7.30 p.m.: "Submersible Pumping Plant," by H. H. Anderson and W. G. Crawford.

MARCH 30

Institute of Metals: Meeting at the Hoare Memorial Hall, Great Smith Street, London, S.W.1, at 2.30 p.m.: "New Aspects of the Electron Theory of Metals (an educational session)."

MARCH 31

Institution of Plant Engineers (North East Branch): Meeting at the Three Tuns Hotel, Durham, at 7 p.m.: "Type and Application of Plant for Open-cast Coal Extraction," by H. Briggs.

North of England Institute of Mining and Mechanical Engineers: Meeting at the institute, Neville Hall, Newcastle-upon-Tyne, at 2.30 p.m.: "Civil Engineering Applied to Colliery Reconstruction," by J. Mitchell.

APRIL 5

Institution of Electrical Engineers (East Midland Centre): Meeting at Portland Building, The University, Nottingham, at 6.30 p.m.: "Submersible Pumping Plant," by H. H. Anderson and W. G. Crawford.

Institution of Plant Engineers: General meeting at the Royal Society of Arts, John Adam Street, Adelphi, London, W.C.2, at 7 p.m.: "Large Span Bridges with Special Relation to the Runcorn-Widnes Project," by J. Kenneth Anderson.

APRIL 5-8

Battersea College of Technology Metallurgical Department: A refresher course, including lectures and discussions covering "The Structure of Metals and Alloys," directed by A. P. Miodownik and J. Mackowiak.

APRIL 6

Combustion Engineering Association (Southern Region): Meeting in London: "The Advantages and Economics to be Derived from Automatic Control on Boiler Plants from 10,000 lb./hr. up to 50,000 lb./hr."

APRIL 6-7

Iron and Steel Institute (Iron and Steel Engineers Group): Meeting at 4, Grosvenor Gardens, London, S.W.1. Four papers on the design and operation of heavy plate mills and their auxiliary equipment.

APRIL 7

Manchester Geological and Mining Society: Meeting at Wigan and District Mining and Technical College, at 4 p.m.: "Hydraulics on Armoured Flexible Conveyors," by C. L. Goddard.

APRIL 13

Midland Counties Institution of Engineers: Meeting at the University, University Park, Nottingham: "Mining Subsidence," by L. H. Spencer.

National Association of Colliery Managers

MARCH 25

Kent Branch: Meeting at the Swan Hotel, Deal, at 7.15 p.m.: "Coal Preparation," by F. H. Price.

Cumberland Branch: Address by K. W. Anderson, of British Nylon Spinners, Limited.

APRIL 8

Midland Branch: Annual dinner-dance at the Sherwood Rooms, Nottingham; reception at 7 p.m.

APRIL 11

Midland Branch: Meeting at the Denman's Head, Sutton-in-Ashfield, at 6.30 p.m.: Paper by H. Wright.

APRIL 12

Yorkshire Branch: Annual general meeting at the Miners' Welfare Hall, Brodsworth, at 3 p.m.

APRIL 29

Kent Branch: Annual dinner-dance at the County Hotel, Canterbury; reception at 7.30 p.m.

Hawthorn Combined Mine Scheme

NOW almost complete, the Hawthorn combined mine scheme, one of the National Coal Board's most important "streamlining" projects, has been concerned with linking and stepping up the production of three collieries in the No. 2 Area of the Durham Division and concentrating the output at a new shaft at Hawthorn Colliery. The three pits involved in the scheme are Elemore, Eppleton, and Murton. Fifty new coke ovens and a coal-processing plant which can deal with 750 tons of coal per hour have been installed at Hawthorn. To achieve this economically desirable arrangement many miles of new roads have been driven underground.

An outstanding feature of the Hawthorn scheme is the great improvement made to underground coal haulage systems. Thirty-eight underground mining locomotives will soon be at work and 31 of them will be of the battery-powered type. Hawthorn will then employ more battery-powered locomotives than any other mine in England. Underground traffic will be controlled by a signalling system designed by the signal and colliery engineering division of the Westinghouse Brake & Signal Company, Limited. Twenty-six of the 31 battery locomotives are of English Electric manufacture and 15 of these use 94-cell Crompton Parkinson traction batteries. Each of these batteries weighs about 5 tons.

Operational Details

During a normal shift the 64-h.p. battery locomotives will travel approximately 350 useful ton miles, hauling mixed loads of just over 50 tons distributed between about 30 2-ton mine cars. Average speed of the locomotives is 9 m.p.h., but speeds of up to 15 m.p.h. can be obtained. The gradients of the new roads, designed to be in favour of the load, range from 1 in 200 to 1 in 25.

All of the Crompton Parkinson batteries are divided into four sections, each section being contained in a sheet steel container. The four sections are bolted on to a sub-frame to make up the complete battery. This arrangement allows a section to be removed from the battery and taken to the surface where repairs can be carried out in the Area centralized battery repair shop.

The ease with which the battery can be removed and placed on charge is of great importance in the operation of underground battery-powered locomotives.

The battery-changing system must be reasonably simple: the fact that such batteries weigh 5 tons must be taken into account. A very efficient system has been adopted at Hawthorn. The battery case is fitted with four rollers designed to roll on strips placed across the locomotive frame. When a battery charge is due—normally after every eight-hour shift—the locomotive is driven between two banks of charging racks. The discharged battery is then linked to its charged replacement and, as one is rolled off, the other rolls on. So far, this system has proved to be entirely successful.

Nine battery charging stations are installed at Hawthorn below ground, three on the upper level at 1,070 ft. below sea level and six on the lower level at 1,365 ft. below sea level. The batteries, which are all of 405 ampère-hours capacity, are given a 16-hour taper charge at present, but eventually they will receive only an eight-hour charge per day, since they will be working two eight-hour shifts daily.

Light-weight Mine Roof Bars

THEORETICAL and experimental work carried out in an attempt to develop a light-weight steel roof bar for support at mine roadheads is described by Mr. E. M. Loxley, Mr. D. Waterhouse, and Mr. B. J. Nield, of the Safety in Mines Research Establishment, Sheffield, in SMRE Research Report No. 173 (December, 1959).

Design criteria for roof bars generally have been established. An experimental method of testing has been developed which allows an assessment to be made of the resistance of the bar to lateral bending and torsional deformation during normal transverse bending tests.

A survey has been made of the possible steels which are considered suitable for the manufacture of roof bars which are to have the optimum strength-weight ratio, and two steels are advanced as being suitable for this purpose.

A description of the method of heat-treatment which should be employed to develop the desired mechanical and metallurgical properties is included. Preliminary underground trials which have been carried out on prototype roadhead bars are described, and conclusions arising from these are drawn.

Design and Operation of Heavy Plate Mills

NEXT meeting of the Iron and Steel Engineers' Group of the Iron and Steel Institute, to be held at 4, Grosvenor Gardens, London, S.W.1, on April 6 and 7, will be devoted to the presentation and discussion of four papers on the design and operation of heavy plate mills and their auxiliary equipment.

"Some Aspects of Plate-mill Design and Operation," a paper by Mr. A. Marshall (Consett Iron Company, Limited), will be presented in the morning of the first day, the afternoon being devoted to a paper by Mr. M. F. Dowding and Mr. C. Sturdy (Davy & United Engineering Company, Limited) on "The Design of Heavy Plate Mills."

On the second day of the meeting, there will be a paper presented by the Society of Furnace Builders, the title being "Plate Mill Furnaces." Mr. H. S. Brown and Mr. A. P. Baines (English Electric Company, Limited) will contribute the final paper, "Developments in Electrical Equipment for Reversing Plate Mills."

Publications Received

WE acknowledge with thanks the following house organs and other publications received.

SUFFOLK IRON FOUNDRY (1920), LIMITED, Stowmarket—"Sif-tips," Vol. 25, No. 107. INSTITUTION OF MINING AND METALLURGY, London, W.1—"Bulletin," January. IMPERIAL CHEMICAL INDUSTRIES, LIMITED, London, S.W.1—"ICI Magazine," January. J. BROCKHOUSE & COMPANY, LIMITED, London, W.1—"The Forge," January-March. MINING, GEOLOGICAL AND METALLURGICAL INSTITUTE OF INDIA, Calcutta—"Transactions," Vol. 55, No. 1. SWEDISH CHAMBER OF COMMERCE FOR THE UNITED KINGDOM, INCORPORATED, London, E.C.3—"Anglo-Swedish Review," January. SHEFFIELD UNIVERSITY MINING SOCIETY, Sheffield—"Mining Magazine," 1959. ZINC DEVELOPMENT ASSOCIATION, London, W.1—"ZDA Abstracts," Vol. 18, No. 1. NATIONAL COAL BOARD, London, S.W.1—"Coal," March.

DAVID BROWN INDUSTRIES, LIMITED, Huddersfield—"Newsletter," January-March. BRITISH PRODUCTIVITY COUNCIL, London, S.W.1—"Target," January. INSTITUTE OF FUEL, London, W.1—"Journal," January. MARTONAIR, LIMITED, Richmond—"Journal of Applied Pneumatics," Vol. 3, No. 23. MOND NICKEL COMPANY, LIMITED, London, S.W.1—"Case-hardening of Nickel-Alloy Steels." DENVER EQUIPMENT COMPANY, Colorado—"Trefoil," Vol. 23, No. 5. ASHMORE, BENSON, PEASE & COMPANY, LIMITED, Stockton-on-Tees and London—"A Service to Industry."

FRANKLIN INSTITUTE, Pennsylvania, Philadelphia 3, Pa.—"Journal," Vol. 268, No. 6. P.G. ENGINEERING, LIMITED, Stockton-on-Tees—"Project and Equipment Engineering from Design to Operation." APPLEBY-FRODINGHAM STEEL COMPANY, Scunthorpe (Lincs)—"App-Frod Record," January. MASTABAR MINING EQUIPMENT COMPANY, LIMITED, Accrington (Lancs)—"Comet Journal," January. LONDON AND SOUTH-EASTERN REGIONAL BOARD FOR INDUSTRY, London, S.E.1—"Output," January. DAVY & UNITED ENGINEERING COMPANY, LIMITED, Sheffield—"Darnall Works of Davy-United."

THE ENGINEERING CENTRE, Birmingham—"News Letter," January. SKEFKO BALL BEARING COMPANY, LIMITED, Luton—"Ball Bearing Journal," No. 3, 1959. TIMKEN ROLLER BEARING COMPANY, Canton 6, Ohio—"Timken," January. FOUNDRY SERVICES, LIMITED, Birmingham—"Foseco Foundry Practice," No. 38.

INSTITUTION OF MECHANICAL ENGINEERS, London, S.W.1—"Chartered Mechanical Engineer," March. EDGAR ALLEN & COMPANY, LIMITED, Sheffield—"Edgar Allen News," February. RICHARD THOMAS & BALDWINS, LIMITED, London, W.1—"Ingot," January. SOUTH AFRICAN INSTITUTE OF MINING AND METALLURGY, Johannesburg—"Journal," January. CRAVEN BROS. (MANCHESTER), LIMITED, Stockport—"Machine Tool Gazette," January-February. VULCAN BOILER & GENERAL INSURANCE COMPANY, LIMITED, Manchester—"Vulcan," January. IMPERIAL CHEMICAL INDUSTRIES, LIMITED, London, S.W.1—"ICI Magazine," February. INTERNATIONAL LABOUR ORGANIZATION, Geneva—"ILO News," February.

ELECTRIC RESISTANCE FURNACE COMPANY, LIMITED, Weybridge (Surrey)—"EFCO Journal," January. INSTITUTION OF MINING AND METALLURGY, London, W.1—"Bulletin," February. INSTITUTION OF MINING ENGINEERS, London, S.W.1—"Transactions," February. ATLAS COPCO (GREAT BRITAIN), LIMITED, Hemel Hempstead (Herts)—"Compressed Air Comments," No. 4. WOODALL-DUCKHAM CONSTRUCTION COMPANY, LIMITED, London, S.W.3—"Murton Coking Plant." ENGLISH ELECTRIC COMPANY, LIMITED, Stafford—"English Electric Journal," No. 4, Vol. 16. MINISTRY OF LABOUR, London, S.W.1—"Information Service," January.

MASSEY-FERGUSON (UNITED KINGDOM), LIMITED, Coventry—"Mobile Power," No. 2. BRITISH PRODUCTIVITY COUNCIL, London, S.W.1—"Target," February. GOVERNMENT INFORMATION SERVICE, Belfast—"Ulster," February. TEES-SIDE AND SOUTH-WEST DURHAM CHAMBER OF COMMERCE—"Tees-side Journal of Commerce," March.

Safety in Mines Research

THE thirty-seventh annual report of the Safety in Mines Research Establishment, entitled "Safety in Mines Research, 1958," has recently been issued by the Ministry of Power (HM Stationery Office, price 5s.). The contents discuss explosives and blasting devices; the explosion hazard, which includes treatment and analysis of mine-road dusts; physical properties of water-proofed stone dusts; and explosion suppression by stone dusts coated with inhibitors. Other subjects dealt with include ignition hazards from sparks from aluminium and its alloys; methane roof layers; effect of atmospheric temperature and pressure on the intrinsic safety of electrical circuits; intrinsic safety of electrical circuits, and rapid analysis of mine gases. Other sections deal with rescue apparatus and fire hazard.

A section on engineering and metallurgical research refers to the fundamentals of metal fatigue; fatigue strength of threaded components in colliery suspension gear; impact tests of materials for cage-suspension and haulage gear, and stress analysis of cage-suspension gear.

Yielding and releasable props and a device for remote release of friction props are discussed. The development of light-weight steel roof bars for roadheads is mentioned, and some general information is included in various classes of colliery ropes and on rope cappings.

Dust measurement and the pneumoconiosis hazard are briefly dealt with, while reference is made to the various testing services conducted by the Establishment.

POLISH RESEARCH ON COAL-MINING MACHINERY

AT the Katowice Mining Institute (Poland), research is being undertaken on the problem of operating coal-face machinery in difficult mining conditions. It is intended to begin working a coal face with fully mechanized and remote-controlled machinery this year.

The equipment has already been tested on a semi-industrial scale on the surface. The solution to the problems is based on the use of a hydro-cutter, cutting the coal by a jet of water under a pressure of 300 atm. It is envisaged that the cutter will move along the face, simultaneously loading the coal on to a steel plate conveyor, and at the same time controlling the movement of hydraulic, self-propelled roof supports. Central control of the whole installation will be exercized from a point some distance from the face.

THE 3,500th Euclid scraper to be produced by the Scottish assembly line of Euclid (GB), Limited, was recently delivered by Blackwood Hodge to Shellabear, Price, Limited. The unit, a TS-24 twin-powered scraper, will join the contractors' other TS-24's on the Grantham by-pass.

Coal Marketing

NEED FOR A CONSISTENT PRODUCT

*By H. L. CLARKE**

Coal should keep its fair share of the country's fuel markets of the future if it is backed up by a product reliable for quality, consistency, and price. In this paper, presented to the Yorkshire Branch of the National Association of Colliery Managers on December 8, 1959, the author outlines the structure of the marketing organization of the NCB, and discusses the problems of selling coal when supplies exceed demand, pointing out the means of arresting the trend away from the use of coal.

BEING an extractive industry, coal mining not only requires highly skilled technical and engineering ability in its management and control, but also long term planning and development to create, restrict or even maintain capacity to meet the fuel requirements of industrial and domestic users. Similarly, the nature of the job necessitates a plentiful supply of highly skilled manual labour, making recruitment, training, and continuous employment difficult problems to control and regulate.

These inherent problems and difficulties cannot be divorced from the marketing organization of the industry. They are features which must be recognized, understood, and used in calculations and assessments relating to market planning and research, so that estimated market requirements can be met over periods of years by long-term planning for development, maintenance, or restriction of productive capacity, not only within coalfields (for industrial geography must be considered) but also in respect of types of coal for particular processes and purposes of use.

Before the second world war many of the features referred to were largely controlled by excess mining capacity, short-time working, and an abundant labour force which could be set on or turned off at will. The ultimate result to the industry was economic and social depression, a condition from which it was only rescued by the war and by nationalization.

The Past

In an age of unrestricted competition between individual colliery companies the level of output was controlled by the ability of the salesman to sell, both in the home and export markets, the greatest possible tonnage even at the expense of economic prices, the main object being to keep the pits he represented working for as long and continuous a period as possible, often at the expense of neighbouring collieries or coalfields.

In the earlier years of the period, cheap labour and easily won coal maintained a certain balance, but in the 1920s economic difficulties arose, resulting in consultations within the industry to endeavour to combat a process of fierce competition for trade which had reduced coal prices in many cases to a level below the costs of production.

Many will remember the minimum prices scheme voluntarily introduced by the coalowners in 1927, the effects of which were promptly nullified either by the formation (by those same coalowners) of trading companies to buy the coal at the fixed minimum prices and subsequently to sell it at a loss, or by collieries openly and flagrantly breaking their price agreements in order to secure business.

In the following years many attempts were made to put the industry on a firm economic basis. The quota system, designed to apportion output fairly among collieries, failed largely because it fortuitously created a new kind of coal market—the buying and selling of quota tonnage. Thus, the failure of this and other schemes culminated in the compulsory selling scheme of 1936, and even that scheme, whereby all sales were made through selling agencies and the apportionment of available business was determined through a series of co-ordinating committees, was often observed more in the letter than the spirit. Nevertheless, it worked with greater success than any previous arrangements, and during the late 1930s coal prices began to rise.

The outbreak of war in 1939 brought Government control to the industry, and so far as marketing is concerned, that control continued in part until the middle of 1958.

So complete was the swing from surplus to shortage as a result of the war and its aftermath, that it was not until 1958 that the Government deemed it safe to remove the remaining wartime controls from the industry. By this time, nearly 20 years had elapsed since anyone had bought or sold coal in this country in a free and open market, and it is a sobering thought that today there is scarcely a man in the industry under the age of about 45 who has had any appreciable experience of selling coal in a buyer's market.

* Marketing director, North-Eastern Divisional Coal Board.

The marketing organization of the National Coal Board is founded on three fundamental principles:—(1) national control, (2) divisional implementation, and (3) regional selling.

The NCB is charged under the Coal Industry Nationalization Act, 1946, Section 1 (i) (*c*) with "making supplies of coal available, of such qualities and sizes, in such quantities, and at such prices as may seem to it best calculated to further the public interest in all respects including the avoidance of any undue or unreasonable preference or advantage."

To accomplish this it is necessary that the selling and distributive policies of the board should be nationally controlled, and the organization of the marketing department is therefore based on principles which require subordination of divisional and Area interests to national considerations, both in respect of pricing policies and in the planning and distribution of supplies in the light of present and estimated future market requirements.

These principles have the following objectives which, in the light of the board's duty to "further the public interest in every respect," can only be achieved by national control. They are:—

(1) Balancing supply and demand and planning for the future through national market planning and research.

(2) Guiding the production and preparation policies of the board in the light of the knowledge so gained.

(3) Ensuring that each division receives an appropriate share of the available markets.

(4) Ensuring that the most suitable coals are made available to the right markets and that coals in high demand are offered for sale to those consumers whose plant and processes need them.

National control involves frequent consultation with organizations whose business it is to observe and assess national needs. These include Government departments, coal consumer consultative councils, trade associations, other nationalized industries, foreign countries, OEEC, and the European Coal and Steel Community. These and similar organizations must be consulted if the marketing department is accurately to assess present national requirements and probable trends in future demand.

Control of marketing on a national basis is effected by the national board through its director-general of marketing and the divisional marketing directors.

They are responsible both for advising the national board on marketing matters and also for the implementation of national marketing policy. There are numerous specialist advisers at the disposal of this team.

Divisional Implementation

In each producing division of the NCB there is a marketing department controlled by the divisional marketing director, who has a dual responsibility to the national board and headquarters marketing department and to the divisional board of which he is a functional member. In respect of the former, he and the organization he controls are responsible for the implementation of national marketing policy as it affects his division, and this responsibility involves:—Planning at divisional level to meet market requirements; assessing availability and the changes in size and preparation necessary to suit changing markets; efficient and accurate implementation of all despatch instructions to serve customer requirements; meetings with local representatives of trade organizations, representatives of other nationalized industries, architects and surveyors of city and town councils, and all industrial consumers.

In respect of his duty to the divisional board, his responsibilities are:—(*a*) Keeping his board fully informed on all aspects of marketing policy and practice and in turn informing marketing headquarters of current affairs and production plans in his division; (*b*) advising his divisional board through its production and other departments on the marketing aspects of reconstruction schemes, proposed development and methods of working seams both new and in current production, and preparation policy and methods to meet marketing requirements; and (*c*) maintaining at Area level through his Area marketing managers liaison with Area general managers and all levels of production, including colliery management, on matters in respect of the proper operation of weigh offices, transport problems, and the determination and maintenance of quality standards.

Regional Selling

The pattern of coal selling which developed after nationalization was based perhaps inevitably on the system of programming or allocating supplies which were a legacy of wartime restrictions. The sale of coal was at first left largely to individual Areas under the general supervision of a "control" marketing office in each division.

By 1953, it had become apparent to the NCB that the wartime control of coal distribution would soon have to end. The board therefore proceeded to reorganize its marketing activities with the object of giving the best possible service to buyers. In 1954, the present system of regional selling was introduced, embodying the division of the country into nine sales regions, all but the London region based on each of eight producing divisions, the broad allocation of trade to regions being decided at national level by the national marketing considerations as previously outlined.

It is the responsibility of the regional sales manager to sell all the coal consumed in his particular region irrespective of the division from which it is supplied, and to maintain an efficient after sales service to all buyers. Once the coal has been sold it is the responsibility of the divisional marketing organization to arrange its subsequent consignment and despatch to the requirements of customers as detailed by the regional sales offices.

The regional sales organization maintains in each sales region a force of outside representatives of two types. The first forms a highly skilled

technical service, available free of cost to all users of solid fuel and to all who contemplate renewing or reconditioning existing fuel burning equipment. This service is ready to advise on types of stokers and boiler equipment, comparative costs of installations and running costs with every kind of appliance and fuel.

The second consists of a team of sales representatives with long experience of service to consumers who not only sell coal for every class of consumer, but also visit buyers with the object of resolving difficulties on the spot, or when they themselves cannot, calling in the technical staff to give expert assistance and advice.

The Problem Today

The last three years have seen a transformation in the fuel supply situation of this country in that, for the first time since 1947, supplies of primary fuels have exceeded demand. The impact of this situation on the coal industry has been profound. Inland coal consumption in 1958 was over 15,000,000 tons less than in 1956 and was likely to be over 25,000,000 tons less by the end of 1959, and competition from alternative fuels, mainly oil, is intensifying. The main problem facing the board's marketing organization today is how to maintain sales of coal in a competitive and shrinking market.

Inland consumption of coal by main classes of consumer between 1956 and 1958 is shown in Table 1.

TABLE 1.—*Inland Consumption of Coal between 1956 and 1958.*

Consumer.	1956.	1957.	1958.	Change, 1956-58.
	Million tons.	Million tons.	Million tons.	Million tons.
Electricity	45.6	46.5	46.2	+ 0.6
Gas	27.8	26.4	24.8	− 3.0
Coke ovens	29.3	30.7	27.8	− 1.5
Iron and steel ..	6.1	5.6	4.5	− 1.6
Engineering	3.4	3.2	3.0	− 0.4
Other industry ..	29.9	28.7	26.1	− 3.8
Domestic	32.2	30.8	30.9	− 1.3
Railways	12.1	11.4	10.3	− 1.8
Collieries	8.0	7.2	6.5	− 1.5
Miners' coal	5.3	5.2	5.1	− 0.2
Miscellaneous ..	18.7	18.0	17.6	− 1.1
Total	218.4	213.2	202.8	−15.6

During the first nine months of 1959, inland consumption has fallen by a further 11,000,000 tons.

The drop in consumption has been accompanied by a corresponding rise in stocks (mainly undistributed at collieries and open-cast sites), as shown in Table 2.

TABLE 2.—*Rise in Stocks of Coal.*

Year ending	1956.	1957.	1958.
Distributed	18.0	18.8	17.5
Undistributed ..	3.0	8.6	19.7
Total	21.0	27.4	37.2

Total stocks at the end of September, 1959, amounted to 50,200,000 tons and are not likely to vary greatly from this figure by the end of 1959. While it is difficult to assess accurately the precise extent of the effect of each contributing influence, the drop in demand since 1956 can mainly be ascribed to the following major factors:—(1) Oil competition; (2) trade recession; (3) greater efficiency in the use of fuel, and (4) variation in temperature.

The effects of the trade recession may be overcome as industrial activity recovers with a resultant stimulus to demand, but the effects of oil competition and fuel efficiency in terms of loss of markets to coal are likely to continue.

Expansion of the oil industry, as Table 3 shows, is no new development in this country.

TABLE 3.—*Total Deliveries of Petroleum Products Used as Fuels for Inland Consumption.*

—	Coal equivalent. Million tons.
1938	13.0
1947	18.5
1950	22.7
1953	28.3
1956	38.0
1958	47.6

This expansion, however, has only operated to the disadvantage of coal in the highly competitive market resulting from the recent sudden decline in total fuel requirements. Between 1956 and 1958, increased consumption of oil in fields where coal could be used is estimated at nearly 8,500,000 tons of coal equivalent, out of a total increase in the supply of oil of 9,600,000 tons. So far this year competitive consumption has increased by over 4,000,000 tons of coal equivalent on 1958.

In 1956, average temperature was 1.3 deg. F. lower than the long-term average, whereas in the first 44 weeks of this year it was 1.6 deg. F. above the long-term average. This alone might account for, say, 3,500,000 tons of the estimated drop in consumption between 1956 and the end of 1959.

Further contributing influences to the swing away from coal are:—

(1) The changed habits of consumers. The husband and wife often both out at work; less need for continuous home heating and thus the attraction of "on tap" fuels from the point of view not of cost (which is generally greater than coal) but of convenience and ease of use.

(2) The implementation of the Clean Air Act which in industry, at least until the recent Order exempting mechanical stokers from the provisions of the Act, certainly stimulated the use of oil, and which in the domestic field has already reduced, and is likely to reduce still further the demand for bituminous house coal.

(3) The generally bad and often hostile Press which the industry has been given ever since nationalization.

Combating the Trend

In the past the emphasis has been on production, a policy not one of choice, but dictated by necessity. It must now be realized that the fundamental purpose of the whole industry is to fulfil the re-

quirements of consumers and to produce, like any other business enterprise, products which can be sold and which by their consistency can be described as " tailor made " to suit individual consumer needs, and the plant on which they are to be used.

Supplies of the best and most easily worked coals are rapidly dwindling, and the thinner and poorer seams which are having to be worked today make for greater difficulty in quality control during mining operations and increasing problems in surface preparation, particularly when treating the output from a mixture of seams. More than ever before it is essential that standards of quality and consistency should be maintained and improved. Every other source of heat is guaranteed in quality; to compete coal must be equally consistent.

This review has not dealt with the prices structure of the National Coal Board. Its form is well known, and much has already been written about it.

From what has already been said it will be recognized that the diversity of types and qualities of coal makes it difficult to achieve a system of flexibility of price of the kind that can be operated by organizations selling a standard product. Moreover, any widespread policy of price rebates or variations would, in the long-term, almost certainly be a retrograde step, degenerating into something uncomfortably close to the disastrous price-cutting of the inter-war years.

Stability of price is an essential to the building up of confidence in the minds of consumers. For some time the oil companies have been " buying " business by operating a flexible and empirical system of rebates from schedule prices, and the feeling is becoming rapidly more widespread that sooner rather than later oil prices will have to rise in order to recover the drain on revenue which these rebates have caused. A stable and well-understood price structure for coal will not only safeguard the revenues of the board but will do far more to maintain confidence in coal and goodwill among consumers than a series of individual price arrangements which could not be kept secret for long.

The general level of coal prices has been kept stable since July, 1957, and this evidence of the board's good intentions has been an important factor in future planning by consumers. For long the fear was of an ever-increasing cost of coal; any such general increase could be suicidal at the present time and so long as present prices are maintained (or reduced), the frequent variations in oil prices are likely to increase the confidence in coal and diminish that in oil.

The merits of coal as a fuel must be publicized. The board is now running at national level an excellent advertising campaign featuring well-known British firms who are using coal. This is being supplemented by advertising in local publications, particularly in the coal-producing divisions. The image of coal as a " fashionable " fuel today must be fostered in the public mind.

For far too long the emphasis at the colliery has been on pithead output and costs of production to the exclusion of almost all else, but it cannot be stressed too strongly that it is at the pit that the product the board wishes to sell is produced. Today, and for the future, it is not just coal that is wanted; it is coal of particular sizes, qualities, and, above all, consistency. The responsibility for this rests primarily on the shoulders of the colliery manager. His duties do not end with the mining of the basic material in accordance with his statutory duties, but include every operation up to and including the loading of the coal into the transport vehicles in the condition in which it is required by the board's marketing department to ensure consumers' satisfaction.

The large stocks of undistributed coal are eloquent evidence of the fact that it is no longer any use producing coal in a size or condition which is not required by the markets. Only each individual colliery manager can ensure that his coal is properly prepared for sale. Only he can ensure that his pit keeps working, because the customer is receiving what he wants to buy.

Conclusion

It is probably true to say that the era of the monopoly of coal as the national fuel supply has now ended and that the future will be characterized by intense competition between many sources of energy with coal, still for many years the major source, but nevertheless only one of several alternatives. For the last 20 years coal has had it all its own way. Driven by the need to produce the last ounce, it has lacked the incentives to seek either popularity or even good business relationships. Today, and for the future, there is a challenge to the industry, a challenge in which the marketing organization of the board must play a major role. Coal marketing today must be realistic and progressive in its approach to present-day sales problems. It must realize that its main function is now to sell and not to allocate and, having sold, must offer a service to buyers which is equal to anything that can be provided by coal's competitors.

If the service it must aim to provide is backed up by a product on which it can rely in respect of quality, consistency, and price, then the marketing department will be well equipped to play its part in ensuring that coal keeps its fair share of the fuel markets of the future in this country.

DISCUSSION

MR. J. OATES, in proposing the vote of thanks, wondered if price structure was what it should be. He asked if a system could be devised for improving the methods of distribution, without lessening the efficiency, and without any extra cost to the consumer. Seconding the vote of thanks, MR. A. JACQUES asked how soon the demand for lump coal from the railways would cease.

In answer to Mr. Oates, the AUTHOR emphasized that in today's markets coal must be " tailor-made " for the job. What the consumer wanted was not necessarily a low ash content, but, above all, a consistent ash content, and that applied whether the coal was used

for power stations, the cement industry, or any category of consumer. It was this feature which had been neglected and the first target must be the achievement of really high standards of consistency. If, however, a low-ash coal was needed for a particular process and was prepared to the required specification, then it could command the resultant higher price in its proper market.

On the question of the cost of coal in non-coal-mining areas the AUTHOR pointed out that the merchant today, compared with pre-war, had to pay far more both for coal and for its transport, and the total costs, including the maintenance of bagging and delivery service might well leave only a narrow profit margin for the comparatively large capital outlay incurred. In answer to Mr. Jacques, the AUTHOR said it was well known that the British Transport Commission was running down on large coal consumption. The BTC had brought forward its modernization programme by approximately three years, with the result that its demand for large coal would be approximately halved by 1965.

MR. C. N. RATCLIFFE, branch president, said the colliery manager knew that large coal was important to the industry. Efforts were being made to increase the percentage of large coal; transfer points and chutes on conveyors were redesigned to give an easy flow, anti-breakage flaps were used in the skip plants. However, when the coal was wound to the surface, it was in some cases passed through a Bradford breaker. Presumably, the marketing department was a signatory to such schemes.

Replying on the question of large coal and the Bradford breaker, the AUTHOR said that many of the large modern coal-preparation plants in Yorkshire were planned during a period of continued manpower shortage to provide full mechanical cleaning and the marketing department at the time agreed with that policy. The effects of increasing underground mechanization and power loading on the percentage of large coal in total output had not then become serious. They were modifying the Bradford breaker to deal only with the larger sized coal so that it reduced only those pieces which were too large to go through the preparation plant; as a result they were in many cases by-passing the breaker completely with the smaller coal. At one colliery it was used successfully to eliminate the soft fractions from large locomotive coal; other methods had proved unsatisfactory.

Pulverized Fuel

In reply to MR. A. HOLDSWORTH, who asked why pulverized fuel had not been developed as a competitor against oil, the AUTHOR said that it had been developed primarily for use on a very large scale for electricity generation and all large coal-fired power stations pulverized their fuel before use today. The manufacture and sale of pulverized fuel by the NCB would mean setting up separate plants at each pit or central plants; the market for such fuel was limited at the present time, apart from its use in power stations. Transportation presented difficult problems; it did not store easily, and was liable to spontaneous heating.

Replying to a question by MR. B. GODDARD, the AUTHOR said that they were often faced with the problem of a sudden overload in a washery which otherwise appeared to be functioning normally, with the result that bad wagons of coal sometimes left the colliery before it was realized that anything was wrong. He did not know whether this really was a job for scientific department; what was required was better control on the operation of coal-preparation plants.

In reply to a question by MR. E. BRAMMER on improving facilities for road vehicles, the AUTHOR said the problem lay in the seasonal nature of the coal trade and the periods of extremely heavy demand which were encountered in the winter months, mainly from industrial consumers. It was, however, noticeably affecting the domestic market today to a greater extent than hitherto. One had to differentiate between those consumers, mainly large industrial concerns, who took their supplies in reasonably regular quantities all the year round and those consumers, particularly in areas such as Leeds, Bradford, and Huddersfield, who required the bulk of their supplies in winter for space-heating purposes, and who wanted coal from the nearest pit at the lowest possible haulage rate, rather than from a pit which was perhaps further away but which was better able to meet their immediate needs. The board had put stocks of coal down at points in Leeds, Bradford, and Huddersfield for this very purpose. The AUTHOR did not think the board should spend large sums of money in providing facilities which would only be used for perhaps four months of the year, and which would remain idle for the remaining eight months. The problem would be eased if consumers could be persuaded to take a proportion of their supplies from other than local collieries.

Increased Demand for Electricity

MR. C. SHEPHERD said he felt that the demand for electricity would increase tremendously in the foreseeable future. The challenge of oil as a cheaper source of fuel could readily be overcome if certain economies were practised. To compensate for the cost of transporting coal, he asked what was being done by the board in conjunction with the electricity authority to build more power stations close to the pits which were producing the type of fuel they needed.

In reply, the AUTHOR said the demand for coal for electricity generation had risen every year from 1947. It was now approaching 50,000,000 tons per annum and was expected to rise to 55,000,000 tons in 1965. They were planning accordingly. It was not always possible to site electricity generating stations near to collieries. Other important features, such as the need for plentiful supplies of water must be considered. The Central Electricity Generating Board, with which close contact both locally and nationally was maintained, planned to site new power stations where water was available and coal was cheapest. Looking ahead, a large proportion of the increasing demand would be met by Yorkshire and the East Midlands according to their capacity to provide the necessary supplies of suitable coal.

Replying to MR. J. W. L. ANDERSON, the AUTHOR was disturbed to hear that satisfactory coal supplies in the summer could not be obtained. He said that consumers had a right to change merchants if they were not receiving satisfaction. On comparative maintenance costs between coal and oil appliances he had no authentic information, but on consumption costs oil was usually more expensive than coal.

Underground Gasification in Czechoslovakia

A pilot plant for the underground gasification of low-quality brown coal is under construction near the town of Chomutov, in the North Bohemian brown coal basin. A small test generator, with a capacity of 3,000-4,000 cub. m./hr. has already been installed. This will be connected to a small electric power station with an output of 1.5 MW. By the end of 1961 it is hoped to complete a larger generator with a capacity of 20,000 cub. m.hr.

New Patents

THE patents below are among the complete specifications accepted listed in the Official Journal (Patents). The numbers given are those under which the specifications have been printed and all subsequent proceedings will be taken.

Applications for copies of the full specifications (3s. 6d. each, post free) should be made to the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.2.

Mining and Mining Appliances

826,410 QUALTER, HALL & COMPANY (SALES), LIMITED, and LEECH, A. Means for loading coal and dirt into skips.
826,411 WESTFALENHÜTTE AG. Mine arch supports.
827,997 BERGBAU-AKTIENGESELLSCHAFT CONSTANTIN DER GROSSE. Mine roofs supports.
827,696 HEMSCHEIDT, H. [trading as HEMSCHEIDT MASCHINENFABRIK, H.] Roof supporting frame for an advancing roof support system in mines.
827,618 KLONNE, A [trading as KLONNE, A. (Firm of)] Pivoted roof bars for mines.
827,273 SCHMIDT, A. Detachable shoe for pitprops.
827,591 MASTABAR MINING EQUIPMENT COMPANY, LIMITED, formerly MASTABAR BELT FASTENER COMPANY, LIMITED. Nut tightening or loosening adaptors for coal or stone drills.
827,368 COAL INDUSTRY (PATENTS), LIMITED. Underground gasification of coal.
827,239 BADE & COMPANY, G.M.B.H. Devices for sinking linings for deep boreholes.
828,458 WESTINGHOUSE BRAKE & SIGNAL COMPANY, LIMITED, and YEARDLY, J. B. G. Lifting and lowering of vehicles, particularly in mine cages.
828,466 LOCKERS (WIREWORKERS), LIMITED. Lining of mine roadways and other tunnels.
828,406 MINE SAFETY APPLIANCES COMPANY. Closed circuit breathing apparatus.
828,370 SMITH, H. M. N. Miners' safety lamps.

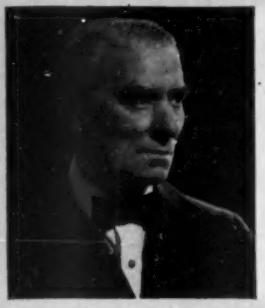
Metallurgy and Engineering

826,609 SVENSKA KULLAGERFABRIKEN A.B. Ingot moulds.
826,514 UNITED STATES STEEL CORPORATION. Apparatus for automatically distributing the air blast to blast furnaces.
826,610 SVENSKA KULLAGERFABRIKEN A.B. Machine for making hot tops for ingot moulds.
826,428 STRACHAN & HENSHAW, LIMITED. Rail-track stop device for holding and locating wagons and the like.
826,380 YORK ENGINEERING & CONSTRUCTION COMPANY. Apparatus for conveying workpieces through a furnace for continuously heating same.
826,466 HADFIELDS, LIMITED. Alloy steels.
826,864 PEMETZRIEDER, G. Apparatus for removing impurities from molten metal by centrifugation.
826,712 WESTINGHOUSE ELECTRIC CORPORATION. Precipitation hardenable austenitic alloys.
826,750 RHEINSTAHL WANHEIM G.M.B.H., formerly EISENWERK WANHEIM G.M.B.H. Mining support frame.
827,619 FOUNDRY SERVICES, LIMITED. Treatment of molten metals.
827,262 METALLURGIQUE D'ESPERANCE-LONGDOZ S.A. Continuous centrifugal casting of metals.
827,346 ALLMÄNNA SVENSKA ELEKTRISKA A.B. Means for measuring the resistance of electrode circuits in electrode melting furnaces under operation.
827,318 WIGGIN & COMPANY, LIMITED, H. Extrusion of metals.
827,957 BRITISH IRON AND STEEL RESEARCH ASSOCIATION. Production of metal from ores and in apparatus therefor.
827,161 STRATEGIC-UDY METALLURGICAL & CHEMICAL PROCESSES, LIMITED. Process for the production of ferro-manganese from low-grade manganese-bearing materials.
827,162 STRATEGIC-UDY METALLURGICAL & CHEMICAL PROCESSES, LIMITED. Process for the production of ferro-manganese products from manganese-bearing materials.
827,364 MINISTER OF SUPPLY. Machinery of titanium and such of its alloys as are capable of hardening upon absorption of or reaction with certain gases.
827,166 GRAY & COMPANY, LIMITED, W., and PIGOTT, E. C. Iron alloys and the manufacture of cast iron.
827,282 ROLLS-ROYCE, LIMITED. Pressure-sensitive control mechanisms.
827,167 BRITISH IRON AND STEEL RESEARCH ASSOCIATION. Measurement of thickness in production of sheet and strip material.
827,268 VORKAUF, H. Control devices for slag clearing members in shaft furnaces.
827,337 STAHL- UND WALZWERKE RASSELSTEIN/ANDERNACH AG. Ingot reheating furnaces.
828,010 HOLDING ELECTROSONIC S.A. Ultrasonic apparatus for the detection of defects in railway rails.
828,000 KLÖCKNER-HUMBOLDT-DEUTZ AG. Roller briquetting press for pressing ores, coal, and similar substances.
827,824 MANNESMANN AG, and METALLGESELLSCHAFT AG. Method of applying highly heat-resistant protective coatings to metallic surfaces.
827,341 INNOCENTI SOC. GEN. PER L'INDUSTRIA METALLURGICA E MECCANICA, and CALMES, A. Continuous rolling mill of the reducing type for tubes.
827,050 VORKAUF, H. Cooled door frames for Siemens-Martin open-hearth furnaces or the like.
828,376 GESELLSCHAFT DER L. VON ROLL'SCHEN EISENWERKE AG. Manufacture of steel.
828,385 INTERSTAHL ETABLISSEMENT. Alloy steel and heavy duty cutting tools made of it.
828,095 SCHLOEMANN AG. Method of cutting samples from the moving rolled material in or at the end of rolling mill trains.
828,237 UNGERER, F. Machine for lubricating metallic sheets.
828,314 DEMAG - ELECTROMETALLURGIE G.M.B.H. Method and apparatus for smelting ore.
828,316 GENERAL STEEL CASTINGS CORPORATION. Railway vehicle truck including a truck frame.

Fuel Treatment and Utilization

827,592 MINISTER OF POWER. Heat treatment of solid fuel.
827,443 STAMICARBON N.V. Process of regenerating separating suspensions in coal and ore washeries, and apparatus therefor.
827,023 KOPPERS COMPANY, INCORPORATED. Coke quenching stations.
825,514 BABCOCK & WILCOX, LIMITED. Classifiers for pulverized fuel.

THE Editor acknowledges with thanks the receipt of a wall calendar from the International Construction Company, Limited, London, W.C.2, illustrated by a picture of two 1,200-ton blast furnaces constructed for the Indian Iron & Steel Company, Limited.



PERSONAL AND PUBLIC RELATIONS

"In Industry Men are More Important than Things"

By SIR WALTER BENTON JONES, Bt., LL.D.*
(Chairman of the United Steel Companies, Limited)

VIRGIL wrote, *Arma virumque cano*, which seems to suggest that there is merit in singing about men. Horace, less liberally, wrote, *Odi profanum vulgus et arceo*—I hate the unhallowed throng, and won't go anywhere near it.

From the title of the Institute of Public Relations I gather that its function is to discredit Horace and to applaud Virgil, to discard secretiveness and to sing with resounding voices the praises of men. Every man or woman, to himself or herself, is the most important person in the world, and as the world is said to be occupied by 2,500,000,000 persons, there must be in the world 2,500,000,000 first-person-singulars.

A company with which I am acquainted (to avoid overworking a personal pronoun I shall call it Vulcan) has adopted as a motto: "Men are more important than things." A stranger visiting Vulcan's properties might be so impressed by the substance of things he saw around him and the energy they exude that the motto might surprise him. Let me explain to the stranger what are the things in Vulcan's organization which he puts second to men.

Vulcan begins with things which extract iron ore from its covering of other rocks; these extractors are enormous and cost millions of pounds. Vulcan then carries the ore away and throws it into burning fiery furnaces, which are also enormous and which also cost millions of pounds. The ore melts and the iron sinks to the bottom of the furnaces. Vulcan ladles out the molten iron and pours it into enormous furnaces of another kind in which impurities are boiled off, after which he adds other more desirable elements. Vulcan has now converted iron into steel. Again the furnaces and their apparatus have cost millions of pounds.

Next he teems the steel into moulds in which, when the steel has set and become what are called ingots, he takes them along, still hot, to various types of manipulator by which the steel is formed into a great variety of products. These may be steel plates of great length and width, to be used for building the hulls of ships, or columns and beams to become the limbs of buildings, or other forms such as the bodies and the inner works of motor cars or aeroplanes, or rails for railway lines, or parts of locomotives or rolling stock—in fact, for almost every kind of structure or machine.

Vulcan also turns his steel into forms for making smaller products, which still require expensive machinery. All the buildings, plant and apparatus for these manipulations cost Vulcan more and more millions of pounds. Taken together, these things may have cost more than £100,000,000 and now might cost even £200,000,000.

Vulcan says: "Of course, these things are important; they are tools and we must have tools, and more and more tools and better and better tools year by year." But in spite of their cost and in spite of their utility Vulcan still says: "Men are more important than things."

The manning of every works or factory varies. In Vulcan's works the number of persons employed is between 35,000 and 40,000—the exact figure is immaterial. Not more than half are engaged in direct production, and few are manual workers. Picks and shovels and most hand tools are things of the past; for the most part the producers are either operating or controlling machines or using tools which are power driven. Next comes maintenance of many kinds, which requires a quarter of the total employed, and the remainder spend their time in carrying things about, doing exercises in arithmetic, buying and selling, educating and training the young, and in one way or another looking after everybody else.

Included in this division of labour is the staff. In Vulcan's organization 30 years ago there would have been one staff to nine other kinds of worker. At the present time there is one staff member to every three and a half other workers. This change may sound rather like Parkinson's law, but in fact with the growth of mechanical aids and substitutes, it is inevitable that staff should also grow. Research, planning, recording, costing, supervision, and other services—all these are needed to discover and adopt means of reducing manual labour, and the introduction of every mechanical device adds something to the work of the staff.

The introduction of mechanical devices not only reduces manual labour—that is the object of it—but it also increases the contribution which personality is able to make in the economy of production. Perhaps the true test is "Does the whole man-

* Based on an address given to the Institute of Public Relations on February 24, 1960.

power produce more per person?" The answer in Vulcan's case is "Yes, and quite a lot!"

Then what about men themselves? In any unit of industry the men engaged form a community in which they spend their working days. Their lives cannot be divided into two parts: one Dreary Work and the other Eat, Drink, and be Merry. Men are just as concerned to be happy in their working hours as in any other hours of the day, and if they are to do their work well, as most men wish to do, they must be well physically and mentally and they must be happy. And in these days in every unit of industry great pains are taken by proprietors to make them happy.

Every boy who enters Vulcan's employment is trained for some form of the work which Vulcan's activities needs. I need not describe the machinery which Vulcan uses for his education and training; it is sufficient to record in a few words the objects of them.

These are the objects: Every man and boy should be taught every job he undertakes. In their work they should be kept familiar with their surroundings; they should be given enough information about their community to awaken and to maintain an interest in it. Means should be provided to help and guide those who want to learn all there is to be known about the special products which they make or the processes in which they are engaged.

Vulcan's Motives

As well as these objects, by some means or other, all should be given the opportunity to acquire general knowledge, for however much men may be able to learn while working in a community, that knowledge will be special, and there are other things worth learning and other things worth teaching.

In all this, Vulcan's motives are not sentimental, nor are they entirely of self-interest. He does not want his men to be dumb, driven cattle; his object is rather to help them to become heroes in the game. It has not been my object to describe the methods and machinery which Vulcan employs in his personal relations. I have used Vulcan only as an illustration and I believe it is typical of industry in this country in these days.

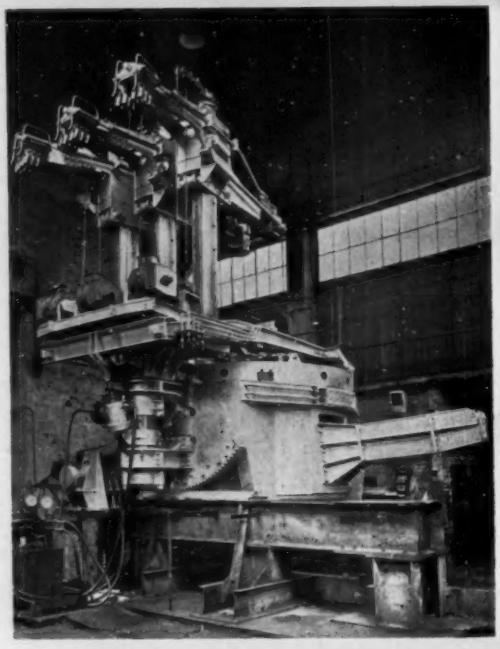
My theme has been first to glance at the massive plant and machinery which industry now employs in ever-increasing quantities and the ingenuity and invention which progressively is substituting machinery for manual labour. And having looked at the more common and much advertised picture of things in industry, to turn to another picture, a picture of persons, in which I have recalled that each one is a first person singular. I have added that in industry and for industry, education, and training of persons are being provided which are keeping step and perhaps advancing in front of the progress of things.

Having looked at these two pictures, I have pointed out that what is behind the more common picture of industry, is a body of first-person-singulars, the body which is the power which drives it and the genius which leads it—men and their personality.

"In industry men are more important than things" is what I have really said. And in a rather long industrial life I have learnt for myself that in industry this is true.

Arc Melting Furnace at Durgapur

THROUGH the Davy & United Engineering Company, Limited, Sheffield, the Electric Furnace Company, Limited, has supplied an Efco arc furnace of 5-6 tons capacity for the foundry at the Durgapur Steelworks. It is capable of providing some 15,000 tons of ingots per annum.



ISCON 6-TON FURNACE FROM SIDE.

The furnace is of the three-phase direct-arc type, having a diameter of 9 ft. 6 in. and a transformer rating of 3,000 kVA. Electricity supply is received at 11,000 volts. three phase 50 cycles, and the furnace is controlled by an air-blast breaker of 350 kVA rupturing capacity.

The furnace is tilted hydraulically, the same hydraulic system being used for raising and slewing the roof. The two motions are interlocked to prevent simultaneous tilting and roof slewing. Interlocks are also provided to prevent the roof being slewed until the electrodes have been raised and the high-voltage breaker opened.

Metallurgical Progress

Some abstracts from recent reports on research and development, at home and abroad

Improved Casting Process for Producing Strong Flaw-free Castings. ANON. (Materials in Design Engineering. 1959. Vol. 50; No. 6; pp. 149-154). Steel castings with tensile strengths as high as 300,000 lb./sq. in. and completely "flaw-free" are now available. Basically the process involves careful selection and control of:—Raw materials and alloying ingredients; size, finish, and casting characteristics of the mould material; melting and pouring temperature and conditions; cooling rate; heat treatment.

The new casting process can produce any desired properties by proper selection of the steel to be used. Stainless steels, air-hardened steels, and other alloy steels can be cast by the process. In general, these castings are said to be stronger than castings produced by any other method; completely reliable; perfectly uniform and homogeneous throughout; can be produced in any size or shape; dimensionally accurate, and less costly than similar parts made by other methods. These castings use either sponge iron or electrolytic iron, and the analysis is carefully controlled. The moulds and cores are made of an undisclosed ceramic mixture which produce controlled shrinkage in the casting as it cools, good surface finish, and close dimensional tolerances. The moulds are made with many risers and are designed so that the poured metal fills every area of the mould within seconds.

High-frequency reduction furnaces are used to avoid direct contact of flames or electrical arcs with the molten metal. The pouring temperature is controlled to within a few degrees. Although it takes a week to prepare the mould for a complex missile part, and a few hours to bring the metal to the correct temperature, pouring from twin ladles takes only a few seconds. For extra high-strength castings, a three-stage heat-treatment cycle is used in homogenization, austenitization, and tempering. To ensure the absence of flaws, each casting is subjected to a series of rigorous tests, including X-ray examination, isotope radiography, and fluorescent-penetrant examination.

Removing Sulphur and Silicon from Hot Metal. ANON. (Metal Progress. 1959. Vol. 75; No. 5; pp. 91-94). The Diamond Alkali Company has revealed the details of its "rotary reactor," a device which reduces sulphur and silicon from blast-furnace iron to low values. Rollers at the bottom of the machine spin a drum rapidly, spreading the incoming hot metal over the inside surface in a thin layer.

As the mechanism offers a large surface area in proportion to the volume of the metal in the drum, there is a rapid reaction with the agents which are added to remove sulphur and silicon. In the 10 to 20 sec. needed to complete the reactions, the hot-metal temperature drops in the range of 7 to 24 deg. C.

Chemical reactions taking place while the drum is revolving are complex. Sodium hydroxide or other strong alkalies, added to reduce sulphur, react directly with the silicon and sulphur compounds in the hot metal. For silicon removal, preheated iron ore and oxygen are added with the desulphurizing agent, and the reaction is exothermic. All of these reactions vary widely in rate, depending on the temperature of the metal, the sulphur and silicon content of the iron, concentration of Na_2O in the slag, and the amount of siliceous inclusions. However, high efficiencies have been obtained and iron has been desulphurized consistently from 0.11 to below 0.02 per cent.—on occasions only a trace of sulphur was detected.

When desiliconizing, the pilot unit has been able to reduce silicon from 1.27 to 0.04 per cent. (69 per cent. removal). Also, phosphorus has been reduced by as much as 28 per cent. during this treatment. The reactor consists of three main parts —base, rotor, and hood. The base is complete with a variable-speed drive and drive rollers. Hot metal flows through the inlet runner and into the revolving rotor. Held to the inner wall by centrifugal force, the metal forms a 1- to 2-in. layer covering the entire surface. Pellets of sodium hydroxide are added so that they overlie the surface of the molten metal.

As the material builds up a head against the dam at the inlet end, a turbulent, helical flow takes place towards the discharge end. Treated metal and slag leaving the rotor are collected in the hood; they flow out continuously through the discharge runner.

Tandem Cold-mill Control. J. W. COOK. (Blast Furnace and Steel Plant. 1959. Vol. 47; No. 11; pp. 1187-1190). The author gives a brief description of a control system for a five-stand tandem cold mill with automatic gauge control. The mill requires large concentrations of power on each stand, so tandem-mill drives use individual generator-power supplies for each stand. The voltage of each generator is matched to a master reference bus, so that voltages and speeds of all stand drives are varied together by control of this reference bus voltage. The stand-generator voltages are controlled by 400-cycle magnetic amplifier-type voltage regulators; excitation for all stand generators is supplied directly by the magnetic amplifiers, which receive their power from a 400-cycle bus energized from a 150-kVA alternator.

Direct excitation eliminates generator exciters, and gives a rapid response with a high degree of stability. A potentiometer for each stand control allows the stand reference voltage to be reduced to approximately 60 per cent. of the reference bus

value. The voltage regulator operates in a voltage-matching scheme to match the stand-generator voltage against the sum of the master reference and the output of the IR-compensation magnetic amplifier. The motor-field strength is controlled by the setting of the main motor-operated field rheostat and also by a vernier rheostat.

Most of the overall gauge-control systems consist of one gauging station installed between stand 1 and 2, and a second one between the final stand and the reel. Screws on stand 1 operate as a rather coarse control to maintain the gauge of the strip entering stand 2 within a predetermined band width. The tension control, used to regulate delivered gauge from stand 5, is rapid in response. Any deviation from the set strip thickness, taken from the gauge between stands 1 and 2, is amplified in a magnetic amplifier and fed to an error detector and transmitted to the timing circuit. The circuit is initiated by a sampling switch and a counter, which measures strip footage passing through the "roll bite."

Stress-relieved Castings. E. W. P. SMITH. (Iron Age. 1959. Vol. 184; No. 23; pp. 116-117). Residual stresses are caused by differential solidifying and cooling of the metal. As the molten metal cools, the outer layers are usually the first to solidify and contract as the metal continues to cool, the already solidified metal opposes further contraction, this introducing residual stresses. Very sensitive gauges are used to measure the strain in castings. Wire strain gauges are cemented to the material upon which stress measurements are to be made. As the material is stressed, both it and the gauge compress or elongate, depending upon the type of stress.

Compression or elongation causes the gauge to change resistance in proportion to the strain. One technique of stress analysis is to cut away portions of the casting. Any residual stresses in the metal are released when the metal is cut away. The section that is left assumes a "free state"; it is no longer restricted by the surrounding metal. Strain-gauge measurements are made before and after cutting portions away. They reflect any change in dimensions in the remaining test section. This procedure can be carried out on both as-cast and stress relieved castings. Castings are cut at the mould parting line.

Care must be taken not to generate too much heat when milling the metal. After each cutting step, strain-gauge readings are taken with a strain indicator. A channel-selector switch permits the taking of readings from three gauges in the rosette.

Standard stress analysis calculations can be made to convert strain to stress. A crankcase in the as-cast condition had a residual stress of 16,000 lb./sq. in., but in the stress-relieved condition it had a residual stress of 1,500 lb./sq. in.

Shot Peening Cuts Stress Corrosion. ANON. (Steel. 1959. Vol. 145; No. 25; p. 88). Stress-corrosion cracking can be controlled in some types of stainless steel by shot peening. Samples of shot-peened stainless steel withstood eight weeks' exposure in 150 deg. C. air-saturated water while holding a 60,000 lb./sq. in. stress. The protective layer can be formed by surface rolling, but formed parts are more easily shot peened. Propelling 0.007- to 0.066-in. shot from a revolving wheel or an air blast provides a means for compressing the surface-grain structure. The intensity is measured by standard (Almen) strips.

After exposure to a shot stream, the strips curve toward the peened side. Curvature is measured by a standard gauge—the arc height must be between specified limits. The longer the strip is exposed, the more the curve increases until it reaches a maximum value. Some imbedding of shot occurs, but tests show it has little or no effect on strength or corrosion resistance. Only areas to be peened are exposed, three layers of tape are used to protect other areas.

Purity of Alloys Checked by Vacuum-fusion Analysis. ANON. (Steel. 1959. Vol. 145; No. 21; p. 82). Samples are vacuum melted in a carbon crucible and the released gases are measured accurately. As the sample melts hydrides, nitrides, and oxides are decomposed. Oxygen reacts with the carbon crucible, forming carbon monoxide. A heated palladium tube, which passes hydrogen, but retains other gases, separate hydrogen from nitrogen and carbon monoxide. The pressure and volume of the isolated hydrogen are measured, and the weight is calculated.

The pressure-volume ratio of nitrogen and carbon monoxide is measured; carbon monoxide is transformed to carbon dioxide and is absorbed from the gas stream. The system is sensitive and can measure a minimum gas content of 0.0002 per cent. Five or six samples are taken from different location in a batch of solid or crushed metals, or one sample is taken from the batch while still in the molten state. If a molten sample is taken, it is cooled immediately and kept several degrees below the freezing point to prevent loss of hydrogen by diffusion.

Iron and Steel Institute's Annual Meeting

MAIN technical sessions at the annual general meeting of the Iron and Steel Institute will be devoted to a symposium on "Wide Strip Production." The meeting will be held in London at the Royal Commonwealth Society, Northumberland Avenue, W.C.1, the Great Hall, Caxton Hall, Caxton Street, S.W.1, and Church House, Great Smith Street, S.W.1, on May 3, 4, and 5.

After the formal business of the meeting Mr. W. F. Cartwright will be inducted as president and will give his presidential address.

Toast of "The Iron and Steel Institute and Industry" at the annual dinner at Grosvenor House, Park Lane, London, W.1, on May 4, will be proposed by Mr. Richard Wood, Minister of Power.

SAMPLING OF COAL

A New British Standard Specification

THE British Standards Institution has just issued, in two parts, a revision of BS 1017:1942—The Sampling of Coal and Coke. These two parts are:—BS 1017:1960, Part 1, Sampling of Coal, and BS 1017:1960, Part 2, Sampling of Coke. These parts also replace BS 735: Sampling and Analysis of Coal and Coke for Performance Tests, which is being withdrawn.

The two parts are self-contained and were, in fact, drafted by separate committees, though the basic principles and some of the text are common to both. A considerable amount of work, experimental and theoretical, has been carried out in the field of sampling during the last 10 years and these new specifications may well claim to be the most advanced in the world. There are signs, however, that other countries—in particular the United States—will not be far behind in producing a "new look" specification.

Future Specifications

This review is concerned with Part 1: Sampling of Coal, but before discussing the specification in any detail, it is worth examining those recent developments that would lead us to expect the coal sampling specifications of the future to be different from those that have gone before. To do this, it is best to look back at history. For longer than there are clear records, it has been realized that to obtain an adequate sample all parts of the consignment must be represented; consequently, sampling by increments has been advocated in almost all specifications.

Specifications differ, however, in their ruling as to how the increments should be collected, how big they should be, and how many are required to provide a given accuracy. Ideally these questions should be capable of theoretical answer and various attempts have been made to derive formulæ whereby the number and weight of increments could be deduced from a knowledge of the size distribution and float-and-sink characteristics of coal.

Most of these attempts used random sampling theory, which relates sampling accuracy to the total weight of sample without reference to the way in which it is taken. Thus, on such theories, samples consisting of 1,000 1-lb. increments would have the same accuracy as one 1,000-lb. increment. This is generally accepted as giving a false picture of the real situation, but until recently no alternative was available. Standard methods, therefore, had to be based on theories which were known to be only approximations to the truth. During the period 1939-49 the situation changed and the statistical theory (and practice) of sampling was greatly expanded. As a result, there is now sufficient theoretical understanding of the problem to formulate the best sampling scheme for a particular problem. This new knowledge, however, has brought difficulties in its train. Previously a method was chosen that would give satisfactory results for the most difficult cases: the same method was, of course, also satisfactory for coals which were easy to sample, but was inefficient in that it gave a much higher accuracy than was needed.

This can now be remedied, but only by introducing the complication of handling each case on its merits. Consequently, although modern specifications must still include the simple methods of general applicability, they must also include more refined methods for use in particular applications. This inevitably means that the specifications will be larger than before: there is more to put in them.

With a chemical determination it may be possible for a supervisor to hand over a British Standard Specification to his laboratory technicians with confidence that if the instructions are followed faithfully the right answer will be forthcoming. This delegation of responsibility is not possible in sampling problems, since many decisions have to be made with regard to the sampling procedures for which a foreman sampler cannot take responsibility. Moreover, the sampling is carried out on the plant, not in the laboratory, where conditions can be standardized, and the choice of the correct method depends on the application of basic principles—which can be specified though the details of the method cannot always be. Consequently, BS 1017:1960 is not intended to be handed directly to the foreman sampler, though the parts which concern him are more clearly and fully set out than before. It is recommended that when routine sampling is carried out on a plant a simple schedule should be drawn up for the use of samplers, based on Appendix A, using the appropriate parts of the specification.

Wide Range of Problems

The wide range of problems covered in the specification may also prove intimidating to the engineer or fuel technologist coming new to the subject. If, however, he first carefully reads the introduction, which gives an outline of the subject, a reference to Appendix A will provide advice on the main questions he has to answer, together with easy reference to the parts of the specification where the answers are to be found. Great care has been taken in the drafting, and the layout is logical and straightforward. Few specifications can have been

subject to such detailed criticism from members of so many large organizations as has this one.

When one studies the specification for the first time it is inevitably the new features that strike the eye. Nevertheless, most of the procedures laid down are only an extension of those advocated previously. As has already been stated, incremental sampling is still the standard method. For coal up to 3 in. in top size, the minimum weight of increment (in lb.) is defined as at least twice the top size (in inches). However, this condition is modified when each increment is a full cross section of a falling stream, in which case the increment size is defined by the size of the opening in the sample container, which should normally be about two and a half times the top size of coal. When very large increments are taken as in automatic sampling, individual increments may be reduced in weight by sub-sampling, provided that all are treated alike.

For a single consignment, the number of increments to be taken depends on the presumed ash, on whether the coal is cleaned or untreated, and on the accuracy required. Three standards of accuracy are defined (High, Normal, Tenth) in the place of the four (± 0.25, ± 0.50, ± 0.75, and ± 1.00 per cent. of ash at 99 per cent. probability) given in the previous specification. It is not now considered that a standard of 0.25 per cent. (99 per cent.) can be guaranteed; consequently, the "High" standard of accuracy refers to ± 0.50 at 95 per cent. probability, *i.e.*, at least 95 out of 100 samples taken in the specified way should be within ± 0.5 of the true figures. With many coals the specified methods will yield greater precision than this. The "Tenth" standard, which allows the error to increase for higher ash coals, is new to British practice, but is convenient in many applications, since the same number of increments can be used regardless of ash.

Bias in Sampling

The new specifications lay great stress on the need to avoid bias in the sampling, *i.e.*, an error always tending to a high or low result. Bias is liable to occur if all the consignment is not accessible to the sampler, in particular when sampling from loaded wagons. Sampling from the wagon top is permitted, and methods for doing so are given, but the accuracy cannot be guaranteed. It is always preferable to sample the coal before loading or when it is being conveyed after unloading.

Recent experimental work has shown that as much care is needed in the preparation of the sample as in collecting it, and BS 1017:1960 provides a greatly expanded section on sample preparation. The gross sample, usually weighing 50 lb. or more, has to be reduced by successive stages of crushing and sample division to provide a few ounces of 72 mesh coal (36 mesh for routine ash and moisture only). Mechanical crushers are obligatory, and high-speed crushers must be air-sealed to prevent loss of fine particles. Sample division may lead to high random errors unless mechanical sample dividers and/or mechanical mixing are employed; hence traditional methods of coning and quartering are no longer permitted. Tables are given specifying the minimum weight of part sample that must be retained after each sample division so as to yield the required accuracy.

When the total moisture content of the coal is to be determined the sample has to be handled with particular care to avoid losses due to evaporation. It is convenient in some cases to take a separate moisture sample, and this is specifically allowed, but the more traditional method of extracting the moisture sample from the gross sample early in the preparation process is still retained. An intermediate air-drying stage is also necessary unless the coal is of high rank.

Regular Sampling

One entirely new feature of the Standard, that of "Regular Sampling," arises from the fact that many works handling quantities of coal do so regularly—*i.e.*, normally receive the same coal from the same source. In such a case prices are determined primarily on average quality over a period, and it may not be necessary to know the quality of individual samples to high precision.

The new specification provides a complete section devoted to methods of checking the results in such cases (Regular Sampling), and of adjusting the sampling frequency to give the required accuracy. The method of duplicate sampling is advocated whereby, when a sample is taken, alternate increments are placed into different containers, the contents of which are then prepared and analyzed separately. The difference in, say, the ash of these two sub-samples is used as an indication of the sampling accuracy. Simple tests are given based on the mean difference for 10 duplicate samples, which indicate whether sampling is being carried out at the desired level. As some coals are much more consistent than others, this procedure often results in a considerable saving in the number of increments which must be taken from the consignment to be sampled.

Another feature of the standard is the care taken to provide the evidence for the methods specified. There are two schools of thought on this. One school would advocate that the specification should stand on its own, without explanation. In the present case it was felt that a proper use of the specification could only follow from an intelligent understanding of the reasons for the methods laid down, and appendices are provided to give the necessary background information.

In conclusion, this specification takes full account of modern developments in the subject. It is likely that both the new ideas and the breadth of its scope will cause some controversy. Nothing new has been introduced, however, which has not already been given extensive preliminary trial, and when the dust of controversy has settled, BS 1017: 1960 should be seen, despite inevitable imperfections, as a considerable advance on its predecessors.

[Copies of the new publications may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1, price 25s. each; postage will be charged extra to non-subscribers.]

Steel Industry Personnel

RECRUITMENT AND TRAINING

"IT is sound policy for companies to recruit sufficient young people to meet their full economic needs in the future and to train them well. It is also in the national interest to do so," says Mr. Lewis Chapman, president of the British Iron and Steel Federation, in a foreword to a report prepared by the federation's Training Committee. The report, "Recommendations on Recruitment and Training Policy for Young Operatives, Apprentices, Technicians, and Office Staff," is supported by the federation's Advisory Committee on Manpower Policy and by the Executive Committee.

The recommendations, which set out both the immediate and long-term objectives which the iron and steel industry should seek to achieve, are intended to serve as a guide to companies. The report is in four sections—recruitment and training policy, junior operative training, craft apprenticeship, and office staff.

Post-war Difficulties

Under the first heading, it is pointed out that most companies have, since the war, found it difficult to recruit the number and quality of young people that they need, some companies having had to employ adults in jobs formerly done by boys. The shortage of young people is now ending and last year the number of boys and girls reaching the age of 15 was 27 per cent. higher than in 1956. In 1962, the peak year, there will be 52 per cent. more and the position will remain at about 20 per cent. above the 1956 level for as far ahead as can now be seen.

While the supply of young labour will vary according to district, there is no doubt that the industry now has an opportunity to take full advantage of its greater availability, and the Training Committee recommends that employers should give detailed consideration to the assessment of their future needs, selection and recruitment, and training of junior operatives, craft apprentices, office staff, and technicians.

Recent developments and modernization have already affected the relative numbers of maintenance and production workers in the industry and further changes will arise from the increasing use of more complex equipment. New skills or different skills will be required on both the maintenance and production sides of the industry and the degree of skill required will in some cases be higher than that of the present skilled production workers or craftsmen. Modern technical developments tend to create jobs which overlap traditional demarcations. A clear-cut distinction between the electrical and mechanical aspects of maintenance, for example, will become increasingly difficult in the future and instrument maintenance already provides a good example of this trend.

Some merging of crafts and process skills is likely and senior production workers will require more technical knowledge than can be acquired by practical experience unsupported by specific training. In addition, more men will be required of a technician grade with a standard of knowledge greater than that of craftsmen but less than that of fully-qualified technologists, some of whom are now doing jobs which do not make full use of their qualifications and ability. Men in this technician grade are required for a wide range of duties concerned with the inspection, control, and planning of operations and maintenance.

Some form of grading of craftsmen with consequent variations in their training, is inevitable in the long term, but is already urgently required, the report states.

The BISF Training Committee advocates that where jobs formerly done by boys have been given to adults in times of shortage, every opportunity should be taken gradually to restore these jobs as openings for the recruitment and training of boys.

The training of young operatives, it is suggested, has suffered more than the training of any other grade in the industry from the scarcity of young recruits. The number of young operatives employed has declined steadily, partly as a result of technical developments and partly because jobs which have traditionally been done by boys have been filled by adults in times of scarcity. The report sets out some recommendations for the training of young operatives for companies to apply according to their particular circumstances.

As far as craft apprentices are concerned, the report states that the traditional system of apprenticeship can no longer be justified by any objective analysis of training needs or methods. Training by "serving time" makes no allowance for the varying ages, aptitudes, and attainments of new recruits or for the increased pace and effectiveness of modern training methods. The committee recommends that the industry should seek the abolition of the present maximum age limit for entry into apprenticeship, a reassessment of the length of apprenticeship for each trade, the introduction of practical tests designed to establish standards of basic craft skill which must be reached before completion of the apprenticeship, and a widening of the range of skills taught in each trade.

While the status of engineers, metallurgists, and other technologists is clearly defined and their training follows a well-established pattern, the status and training of those whose standard of knowledge and skill lies between the levels of skilled craftsmen and technologists is less clear. Present technological trends in the industry will make it necessary to train increasing numbers of people of this kind and it is important that their training and education should be planned with their ultimate duties in view. There is, the report emphasizes, a real need to recognize the emergence of a technician grade with standards and requirements of its own.

It is suggested that the time is opportune to examine and co-ordinate present views on the status and qualifications of technicians in the industry and to determine the principles governing their recruitment, training, and education. A further study of this problem is to be carried out.

MINES IN THE United States produced 253,000 net tons of recoverable lead during 1959, according to the US Bureau of Mines. The 1959 quantity was 5 per cent. less than that of 1958 and was, in fact, the lowest domestic mine output since the turn of the century.

Marine Sedimentary Iron Ores

MODE of origin and conditions of formation of sedimentary iron ores are of more than theoretical interest, since a proper understanding of these factors may facilitate the development of mining operations and their extension into adjacent ground. Hitherto it has been generally accepted that, in the course of rock weathering, iron is removed in solution from continental areas and is later precipitated on arrival in an alkaline marine environment so as to form oolitic deposits of minette type. According to this hypothesis the main body of such iron deposits should always be located in the immediate vicinity of the contemporary shore line.

Past experience in mining sedimentary ironstones seems to confirm this assumed relationship between ore formation and palaeogeographical conditions, for exploitation has hitherto been preferentially conducted along the margins of the ancient marine basins and troughs. Recent discoveries of several important seams of iron ore below the North German Plain, however, appear to show that in this instance wide regions of open sea have repeatedly been the site of precipitation of iron ores.

The question is thus raised, states Prof. Dr.-Ing. H. Borchert in a paper presented to the Institution of Mining and Metallurgy and published in the Proceedings (March, 1960), as to whether the mobilization of the iron and also its primary precipitation could have been effected *within* a marine basin.

General Conclusions

The author's conclusions are that the main concepts of marine sedimentary iron-ore formation may be summarized as follows:

Weathering solutions from continental regions do not normally produce marine sedimentary iron ores of the minette type. The iron content of minette ores and iron ooliths has its origin predominantly in the marine environment. This is highly probable in the case of post-Devonian iron ooliths and is certain in the case of pre-Devonian marine ores. Throughout Pre-Cambrian times the necessary reducing conditions for mobilizing significant quantities of iron could nowhere have existed in continental areas. Indeed, during those times weathering conditions must have yielded a pure red bed facies, where iron is practically insoluble.

There are four principal types of iron-ore facies: limonite, siderite, chamosite, and pyrite, listed in order of decreasing oxidation potential. The characteristic values *p*H and Eh can be calculated on the basis of modern measurements in natural environments. The most abundant quantities of iron are dissolved in the CO_2 zone and are later precipitated in the oxygen-bearing shallow-water zone. Smaller amounts of $Fe(HCO_3)_2$ migrate into zones of increasing reduction potential to combine with silica originating in the alkaline H_2S zone so as to form chamosite.

The configuration of the different facies of limonite, siderite, chamosite, and pyrite tends to follow the coast lines. This arrangement is not due to weathering solutions from the continents transporting iron at right angles to the coast line, but to the fact that the sea current usually ran virtually parallel to the morphological features of the basins and consequently also to their margins. The most important causes of vertical and lateral variations in the iron-ore facies are changes in the sea currents, each with its own characteristic physico-chemical conditions. For small-scale variations in time and space, climatic changes are the most important controlling factors and not epeirogenic syn-sedimentary vertical movements of the earth's crust.

Vertical movements of the crust are the dominant factor in effecting prolonged changes of sedimentary types, but are not responsible for short rhythms in bedding and sedimentation. Most ores of the minette type were deposited during non-orogenic periods free from major crustal movements.

Iron-ore ooliths have no direct relation to marine transgressions, though these are important in connection with the "Trümmererze" of the Peine type. Iron-ore ooliths are not directly related to the saline facies, though both these types of deposit are partly related to the facies of bituminous shales and black schists. Both tend to occur during periods of weak post-paroxysmal movements of the earth's crust.

Tasmanian Iron-ore Deposits

TASMANIA's iron-ore deposits at Beaconsfield and Blythe River are to be submitted to investigation. At present the Government of Tasmania is concentrating on the Savage river area of the West Coast, and it is hoped that these deposits may be the foundation of a steel industry. Testing of the Savage River deposits by drilling and by oversea furnace checks is first needed to indicate this possibility. Mining of iron ore for export from Tasmania will not be permitted until results are known.

The Savage river iron ores occur as a massive series of lenses extending in a north-south direction over a distance of nearly 2½ miles. The ore consists chiefly of magnetite and is regarded as a magmatic segregation in a belt of basic igneous intrusive rocks and their derivatives of Precambrian age. The country rocks have been extensively mineralized by pyrites. The iron deposits form a strong ridge and the lenses appear to dip steeply to the east. Other outcrops of a similar nature occur some four miles south at Long Plains and at Rocky river, some 14 miles south of the Savage river. These are apparently the outcropping deposits, in a long belt of geologically favourable country.

THE spring meeting of the Institute of Welding will be held at Droitwich from May 9 to 11. It will be devoted to the novel welding processes and metal spraying. Five papers on different aspects of metal spraying have already been prepared, and it is intended to devote the whole of one technical session to these.

New Equipment and Products

Payloader Tractor Shovel

LATEST product of the Doncaster works of the International Harvester Company of Great Britain, Limited, is the Hough payloader. The first model, the Hough H-70 payloader, is a 105-h.p., four-wheel-drive tractor shovel, with a carrying capacity of 7,000 lb., which can be equipped with a wide range of buckets for specialized purposes. The tractor is equipped with torque converter and Paylomatic power-shift transmission providing three travel ranges, in both forward and reverse directions.

The payloader is a new product of the Doncaster works and will not embody any units used in current wheel or crawler tractor production.

Dust Extraction Plant

RECENT addition to the range of dust collection and control plant manufactured and marketed by the gas cleaning division of W. C. Holmes & Company, Limited, is the Holmes-Retroflux bag filter. This filter was developed by Standard Filterbau G.m.b.H., of Munster, and is to be manufactured under licence in the United Kingdom. An efficiency in excess of 99 per cent. for all particles, including those of sub-micron size, is claimed.

In operation, the dust-laden air enters a header within the casing and is distributed to the inside of the filter bags, the air and dust moving in the same direction (Fig. 1). The tendency of the dust to settle by gravity is not impeded by air currents, as the air passed through the filter bags radially and the air velocity gradually diminishes to zero at their lowest end. The dust collected on the inner surface of the filter bags is continuously dislodged by the passage of high-velocity air jets through the fabric in the reverse direction to the main air stream.

Dislodged dust falls by gravity to a worm conveyor or hopper below. The use of high-velocity air jets is a design feature of the bag filter, which dispenses with the rapping or shaking mechanism and separate compartments encountered in other types of bag filters.

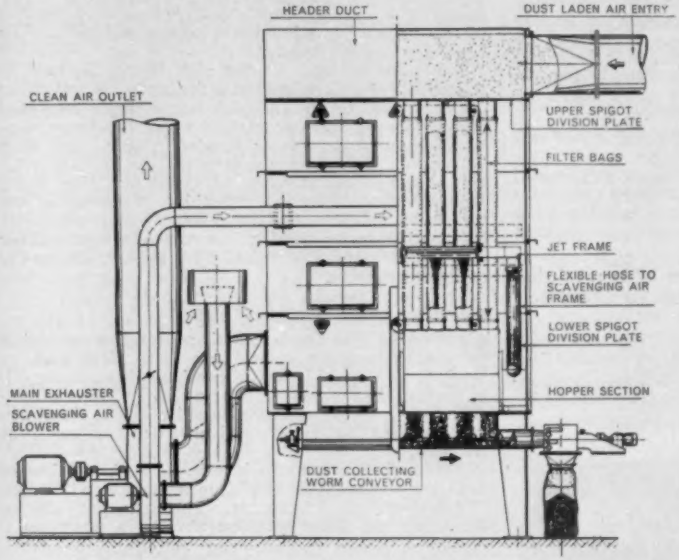


FIG. 1.—GENERAL ARRANGEMENT DRAWING OF A HOLMES-RETROFLUX BAG FILTER.

Thorite Motorized Drum

NOW being manufactured by the Richards Structural Steel Company, Limited, Leicester, is the Thorite motorized drum, a contribution to materials handling. It is designed to cover basic conveyor and elevator requirements and can offer many advantages when incorporated in equipment needing electric motive power and reduction gearing.

The drum is a compact single unit which can be easily and rapidly installed. It is necessary only to fit the revolving shaft into a self-aligning plummer block, the stationary shaft into a fixed retaining bracket, and to connect a three-phase supply to a junction box. Since all electrical and mechanical parts work in optimum conditions, sealed within the drum shell, many common causes of breakdown are completely eliminated. The electric motors are specially designed three-phase stator-rotor units of continuous maximum rating, ranging from fractional to 20 h.p.

Epicyclic reduction gears, which are installed, give a wide range of speeds, and are machined from suitable grades of steel, meehanite, or spheroidal graphite iron. The compound and final gear wheels run on matched taper roller bearings and compensation is made for out of balance forces.

There is a wide range of drum diameters and widths, and the standard drum shells are crowned. The drum contains a suitable amount of oil, which is free to circulate through available spaces in both the stator-rotor and gears. The oil thus acts as a lubricant for working mechanical parts, and bearings,

and a coolant for the electric motor, the windings of which are dipped in epoxy resin.

Tramp-iron Diverter

SPECIALISTS in magnetic engineering, Rapid Magnetic, Limited, Birmingham, announces an extension to its range of tramp-iron diverters to cover burdens beyond the capacity of conventional pulley and pulley-type separators.

A typical unit for the recovery of iron-bearing slag measures 42 in. dia., 60 in. wide, and weighs approximately 6¼ tons. High-temperature class B insulation is used throughout to cater for the treatment of hot slag, while the drum cover is of substantial thickness of stainless steel provided with expendable outer covers.

Quick-release Coupling

A NEW quick-release self-sealing coupling (Fig. 2), for use in hydraulic feed lines with working pressures of up to 3,000 lb./sq. in., is announced by Super Oil Seals & Gaskets, Limited, King's Norton, Birmingham. The new coupling is an addition to the manufacturer's range of Aeroquip flexible hose and end fittings. It is being made with either British standard or American threads, and, by the use of adaptors, is available in ⅜-in. and ½-in. sizes. The coupling is designed for use on both general industrial and agricultural equipment and for the latter type of application a mounting bracket is supplied, which enables the coupling to be fixed to a tractor or some other towing vehicle. When installed, one half of the coupling is held by the bracket while the other half is free to disengage automatically should an unexpected pull be applied to the hose line. In this way, both hose and coupling are safeguarded from accidental damage. Used with or without the "breakaway" bracket, the coupling is self-sealing on disconnection.

Simple in construction, the coupling consists of two halves, each using a spring-loaded poppet sealing valve and a spring-loaded thimble ring for quick attachment. When connected, the halves of the coupling are sealed with a rubber sealing ring and held in position by a series of hardened steel balls working in tapered location holes.

Test results show that there is negligible restriction to the flow of hydraulic fluid through the coupling.

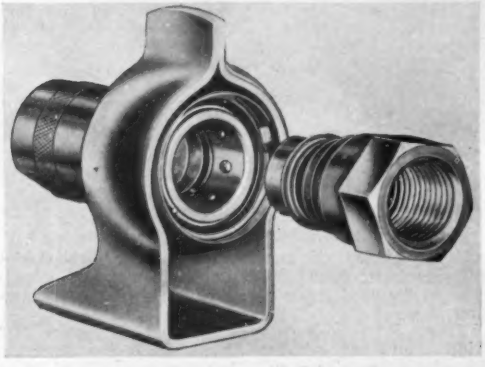


FIG. 2.—QUICK RELEASE SELF-SEALING COUPLING WITH BREAKAWAY BRACKET.

Wet-type Pick

KNOWN as the FL 18W, a new wet-type pick has been developed by the Consolidated Pneumatic Tool Company, Limited, London, S.W.6, for use where suppression of dust by water spray is required. In this pick (Fig. 3), water is fed to a swirl spray fitting, sited near the nose of the pick, resulting in the formation of

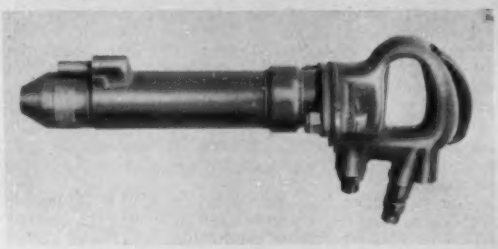


FIG. 3.—NEW CONSOLIDATED WET PICK.

a dense mist round the pick steel. The high concentration of finely divided water particles so formed enables a very high degree of wetting of the dust raised by the pick steel to be achieved while enabling the rock being worked to be kept thoroughly wet.

Air and water channels are independent and of particular note is the fact that the model is water controlled and cannot be operated as a dry machine due to the design of the throttle, which requires water at a pressure of 20 lb./sq. in. minimum pressure before the air control becomes effective.

The overall length of the pick is 19¼ in. and its weight is 23½ lb. Nipple size for both air and water inlets is ¼ in. BSP. The pick has a single combined throttle control for both air and water, this being combined in a single rubber bonded trigger. All seals and valve seats are obtained by the use of "O" rings and extensive use is made of Grovelock pins which facilitate dismantling and assembly. A feature of the tool is full cushioning of the piston, which considerably improves operator comfort. A screw-on type retainer is employed, which is locked by a rubber ring and is easily removeable.

Gear for Drop Hammer Control

DESIGNATED the Aeromatic gear, a new method of drop hammer control has been developed by B. & S. Massey, Limited, Openshaw, Manchester 11. It enables the delivery of light or heavy blows of predetermined stroke, ensuring sensitive control, and can be operated by either pullcord or foot-pedal, as required.

Aeromatic gear control is supplied with all sizes of both self-contained friction drop hammers and Massey "Marathon" drop hammers. The gear may also be fitted to some older hammers already in operation.

Low-shaft Furnaces in India

The first low-shaft furnace in a chain of five such furnaces, now being set up by Kalinga Industries, Limited, has gone into operation at Barbil in Keonjhar district, Orissa. Designed by Fried Krupp and erected under the supervision of Indian engineers, the furnace is operated with small size ore and small size coke, which cannot be used in any conventional blast furnace. The furnace has a capacity of 120-150 tons of foundry iron a day.

OXYGEN LANCES IN OPEN-HEARTH ROOFS

US Steel Corporation's Experience

The use of oxygen lances in open-hearth furnace roofs formed part of a paper by H. A. Parker, division superintendent, steel producing, Fairless Works, United States Steel Corporation, and Philip Schane, Jr., given at the Philadelphia technical meeting of the American Iron and Steel Institute. In their contribution, which is summarized below, the authors discussed the advantages of oxygen, correctly applied, to individual furnaces, and the tendency to lower efficiency as the number on oxygen was increased beyond a certain limit.

SPEED of the open-hearth process is mainly dependent on the rate at which heat can be supplied to the bath for the melting of metallics and slag and the reduction of iron oxide. The rate of heat transfer from a flame to the bath through the slag is very slow; but with oxygen injection in the bath, the heat generated is absorbed very rapidly and efficiently. When a given quantity of carbon is oxidized by elemental oxygen, excess heat is generated in sufficient quantity to permit oxidation of an equivalent amount of carbon by reaction with iron oxide in the bath. The very high utilization of the heat generated by direct oxidation of the bath with oxygen should be noted.

Almost all of the heat is transferred directly to the bath and is available for useful work. When conventional fuels are burned over a bath of molten slag and iron, the efficiency of utilization of the heat generated is very low, being between 15 and 20 per cent., because with a combustion flame temperature of approximately 1,900 deg. C., the waste gases leave the furnace proper at between 1,550 and 1,650 deg. C., although, of course, some of the heat in the gases is recovered in regenerators and waste-heat boilers.

In this paper the authors discuss the use of oxygen in the bath through roof lances during the entire working period of the heat, a practice which heretofore had not been successful. The use of oxygen for aiding in the combustion of the external fuel is well understood and practised when considered economical. Such application is generally found advantageous with high scrap charges or where there are deficiencies in air supply, regenerator capacity, etc.

Additional Incentive

The introduction of low-cost tonnage oxygen provided an additional incentive for the development of practices for the extended and more general use of oxygen in the open hearth to obtain the production advantages possible without damage to the furnace structure.

Roof lances are now installed and operating on 73 of the 256 open-hearth furnaces of the United States Steel Corporation. These furnaces are all operating on hot-metal practice, the hot metal in the charge varying from 40 to 75 per cent. of total metallics. The time for starting the oxygen blow varies, in individual plants between 0 and 30 min. after the last hot-metal addition. With lower percentage hot-metal charges, oxygen has been used even before the hot-metal addition to assist in heating and melting the scrap. This permits earlier addition of hot metal and reduction in heat time.

On shallow bath furnaces, steep angles on the lance openings may cause excessive bottom erosion with high oxygen velocities. Higher oxygen velocities with steeper angles can be used on deep bath furnaces. The rate of oxygen flow should be within a determined range to give optimum results in production. Below this range, the action of the heat is irregular and very little benefit is obtained. Above this range, operation becomes difficult to control because of the possibility of excess temperature and consequent furnace damage.

Single Lance Desirable

A given amount of oxygen, whether supplied through a single lance or through multiple lances, will, in general, do equivalent work. A single lance is desirable for operating and control reasons, but it may be necessary to install multiple lances to keep the various factors within optimum ranges for control and the prevention of high repair and maintenance costs to the furnace.

The two types of lances in general use at the authors' works have heads of high-conductivity copper, the rest of the lance being of steel. The head of the 6½-in. dia. lance is of cast copper, and the head of the 4½-in. dia. lance is either forged or machined to shape from a 4½-in. dia. forged copper round. All of the lances in use have six holes, ⅜- to ¼-in. dia., at angles of 20 to 30 deg. from the vertical. The life of lances has been improving and is now approximately 80 to 100 heats per head.

Regarding operating results, data indicate that with the use of 300 to 600 cub. ft. of oxygen per ton of ingots, there is a saving in heat time of 10 to 25 per cent. and a saving in fuel of from 18 to 35 per cent. The important improvement in heat time is accompanied by a more than proportionate saving in fuel. This is because the fuel firing rate can be reduced during oxygen blowing. Carbon monoxide is released as a fuel at a higher

rate because of the faster elimination of carbon from the bath. Also, additional heat is evolved by the direct oxidation of the bath with oxygen.

A small loss in yield has been generally indicated, apparently due to higher iron oxide in the flush slag, caused by the faster and more active flush obtained when oxygen is used immediately after the hot metal addition. The iron oxide content of the tap slag is normal for a given tap carbon. The loss in yield could probably be eliminated or reduced by earlier charging of hot metal or by delaying the use of oxygen.

In oxygen practice, a carbon drop of 0.75 to 0.90 per cent./hr. is obtained. Sulphur elimination appears to have improved, as evidenced by lower final sulphur content of the steel or a fall in the amount of lime required.

Results given in the paper are for heats produced when only one or two of the furnaces in each of the shops were equipped with roof lances. As the number of furnaces so equipped increased, it was evident that the optimum benefits were not always obtained.

Need for training on the part of the men contributed to this, but a larger part was due to the inability to service properly the greater number of heats produced.

One important result observed was the virtual elimination of excessively long heat times caused by stickers, low melts, cold heats, etc. The ability of the oxygen lance rapidly to put heat directly into the bath, regardless of slag or pre-heat air conditions, is of great assistance on these abnormal heats.

Because of the speeding up of reaction rates and production, it is important that the operator keep closely informed of the temperature and carbon content of the bath so that proper action can be taken without delay. A delay of a relatively short time in making a limestone or ore addition, or reducing firing rate, may result in an increase in temperature of the bath. This could cause serious damage to the furnace structure and bottom, as well as consequent delay for repairs.

Continuous determination of bath carbon content and temperature would be a valuable tool. It might permit further increases in oxygen usage and consequent reduction in heat time with gain in production. Experience has shown that further gains could be made by the increased use of oxygen, but the control is more difficult and the incremental benefit of the increased amount is less. Also, even with adequate servicing equipment, in a stationary open-hearth furnace certain minimum times are required for operations, such as charging the furnace, slag removal, setting spouts, charging hot metal, etc. The authors' practice is aimed at maintaining smooth, efficient operation of a furnace and arriving at the proper tap carbon, temperature, and slag condition at the same time with a minimum demand for exceptional skill or effort on the part of the furnace operator.

Determination of Gases in Metals

ORGANIZED by the Society for Analytical Chemistry in conjunction with the Iron and Steel Institute and the Institute of Metals, a meeting on "The Determination of Gases in Metals" will be held at Convocation Hall, Church House, Great Smith Street, London, S.W.1, on May 3 and 4. Details of the programme are as follow:—

SESSION 1 (2.30 to 4.0 p.m.): "Sampling of Liquid Metals," by Prof. T. B. King (Massachusetts Institute of Technology); "The Determination of Oxygen in Metals: a Review," by Mr. W. T. Elwell (Imperial Chemical Industries, Limited, metals division), "The Determination of Gases in Metals by Vacuum Fusion," by Mr. J. E. Still (General Electric Company, Limited); "The Determination of Gases in Metals by the Semi-micro Vacuum-fusion Technique," by Mr. A. Parker (UK Atomic Energy Authority).

SESSION 2 (5.0 to 7.30 p.m.): "An Assessment of Carrier-gas Methods for the Determination of Gases in Metals with Particular Reference to Steels," by Mr. C. E. A. Shanahan (Richard Thomas & Baldwins, Limited); "The Determination of Oxygen in Beryllium by Activation Analysis," by Mr. R. F. Coleman (UK Atomic Energy Authority); "Emission Spectrometric Determination of Oxygen, Hydrogen, and Nitrogen in Metals," by Prof. V. A. Fassel (Iowa State College); joint discussion of the above papers.

SESSION 3 (9.45 a.m. to 12.45 p.m.): "The Determination of Nitrogen in Metals: a Review," by Dr. J. D. Hobson (Hadfields, Limited); "The Determination of Nitrides in Metals," by Dr. H. F. Beeghly (Jones & Laughlin Steel Corporation); "The Determination of Hydrogen in Metals: a Review," by Mr. R. Eborall (British Non-Ferrous Metals Research Association); "The Determination of Hydrogen in Cast Iron," by Mr. J. V. Dawson and Mr. L. W. L. Smith (British Cast Iron Research Association); "An Improved Carrier-gas Technique for the Determination of Hydrogen in Steel," by Mr. F. R. Coe and Mr. N. Jenkins (British Welding Research Association).

SESSION 4 (2.15 to 4.45 p.m.): "X-ray Emission Analysis and the Determination of Gases in Metals," by Mr. T. Mulvey (Associated Electrical Industries, Limited); "Application of Internal Friction Measurements to the Study of Gases in Metals," by Dr. G. M. Leak (BISRA); general discussion.

STEEL-TUBE PROJECT IN INDIA

A SEAMLESS tube plant, stated to be the first in India, was inaugurated at Jamshedpur on January 28 by the Union Finance Minister. Built at a cost of Rs. 30,000,000 this plant represents the third and the final phase of the Rs. 80,000,000 tube project, jointly undertaken by British and Indian interests—Stewarts and Lloyds, Limited, and Tata Iron & Steel Company, Limited. With the addition of the seamless plant, the tube works at Jamshedpur now has a capacity of 140,000 tons of steel tubes per year.

Located close to the Tata steelworks, which provides the main raw material, the tube plant occupies a 72-acre site. This undertaking, employing 1,700 workers and supervisors, has already produced some Rs. 260,000,000 worth of tubes. The completion of the seamless tube mill provides India with self-sufficiency in all sizes of steel tubes from ½ in. up to and including 6 in. nominal bore.

Increased Boiler Efficiency

METHOD of increasing the efficiency of boilers in applications where there is a fluctuating demand for steam has been developed by British Boiler Accessories, Limited, 62-63, Fenchurch Street, London, E.C.3. This involves the use of a Lancashire boiler which can be a steam accumulator or standby boiler and which, by storing surplus steam produced during periods of small demand and releasing it during peak load periods, enables the boilers to operate steadily at an even rate corresponding to the average steam consumption throughout the day.

The economy effected in the use of fuel by avoiding banked boilers can be between 5 per cent.

LANCASHIRE BOILER FITTED WITH INCREASED STORAGE CAPACITY.

and 10 per cent., the increase in efficiency being also reflected in reduced maintenance costs and the elimination of lost time waiting for steam during peak periods.

In the BBA steam accumulator the steam is stored in the form of hot water and the system works on the variable pressure principle. This depends on the fact that the boiling point of water varies according to the pressure on its surface; thus the boiling point, which is 212 deg. F. at sea level, increases to 388 deg. F. at a pressure of 200 lb./sq. in.

The water is contained in a closed vessel which is partly filled and its temperature is raised to 212 deg. F. by mixing it with live steam. When this temperature is reached, a small amount of steam is formed, which, as it is unable to escape, increases the atmospheric pressure within the vessel. The temperature is then further increased by mixing the water with more steam and when this reaches the boiling point corresponding to the increased pressure, another small amount of steam is produced which again increases the pressure, the process being continually repeated.

When a valve at the top of the vessel is opened to release the steam for use, the pressure within the vessel is reduced and as the water has a high temperature in relation to the new pressure, it commences to boil, a certain amount of it being converted into steam. This takes out a quantity of the latent heat from the remaining water, the temperature of which consequently drops until the balance between pressure and temperature is restored.

An external charging device has been developed for fitting to standby Lancashire boilers which works similar to an injector. Live steam from the high-pressure main is injected through a nozzle, creating a strong suction effect, which draws water from the standby boiler and injects it into a Venturi tube where the steam and water are thoroughly mixed, the steam being condensed. The heated water flows to the upper part of the standby boiler and sets up a strong circulation of its water contents whereby cool water is drawn from the lower part of the standby boiler, heated in the charging device and returned to the upper part. The accumulator/standby boiler is thus charged by gradually raising the temperature and pressure of its contents.

Discharge is controlled by a reducing valve and charging can be controlled either manually or by a valve worked by the high-pressure main in which case the accumulator works automatically.

In cases where Lancashire boilers have been converted into steam accumulators by the fitting of the charging device the cost of fitting has been recovered in as little as 12 months' operation. In addition to providing increased efficiency and flexibility in operation the adoption of the BBA system can yield additional advantages in the form of elimination of labour during periods of light steam demand by high boiler efficiency. Smoke emission can be eliminated to comply with the Clean Air Act.

India's Largest Electric-arc Furnace

A 12-ton electric-arc steel melting furnace, the biggest in the country, was formally inaugurated recently by India's Defence Minister at the Metal and Steel Factory, Ishapore, about 18 miles from Calcutta. Built at a cost of Rs. 1,900,000 the furnace will produce 60 tons of high alloy steel/day, to be mainly used for defence service stores.

£6,000,000 Iron-ore Project

Broken Hill Proprietary, Limited, plans to develop the iron-ore deposits on Koolan Island, in Yampi Sound, in Western Australia's north-west at a capital cost of £6,300,000. BHP expects to recover at least 2,000,000 tons of ore annually. A cargo wharf, access roads, an airstrip, and a township to cater for a population of about 600 will also be built.

All Stanton Furnaces Back in Blast

FOR the first time since January, 1957, all five furnaces at the Stanton works of the Stanton Ironworks Company, Limited, near Nottingham, are now in blast as a result of substantial improvement in the pig-iron market. The No. 5 furnace, which has been out since September 8 last year, was lighted by Miss Margaret Wilson (16), daughter of Mr. C. H. Wilson, president of the Institute of British Foundrymen and assistant to the assistant managing director (works).

The furnace was blown out last September for relining and repairs. During relining, the hearth diameter was increased from 16 ft. 6 in. to 19 ft., an increase of about 15 per cent. It thus becomes the largest Stanton blast furnace. The furnace has been fitted with the same underhearth cooling method as for No. 3 furnace, but with improvements in design. No. 3 furnace, which was blown in in 1958, was the first blast furnace in the country to have underhearth cooling, a method which has proved itself satisfactory.

The stack volume of No. 5 furnace has also been increased by using a thinner lining than normal, built in low-porosity firebrick with a very high resistance to abrasion. The bricks have been laid in a spiral design to obviate loss of time in fitting closure bricks necessary in the conventional method of lining a furnace. It is the first stack lining in the country to be constructed in this way. When fully commissioned, the furnace is expected to produce 2,500 to 3,000 tons of pig-iron a week.

Mr. E. M. Summers, general manager (iron production), opened the ceremony and Mr. G. R. Buckley, assistant managing director (works) introduced Miss Wilson. Afterwards a presentation was made to Miss Wilson by Mr. P. J. Walsh, 66-year-old furnaceman, who has been with the company for 43 years.

Employers Criticized for Training "Failure"

ALLEGATION of failure on the part of north-eastern industrialists to provide technological education for their young engineers and chemists was made on Monday by Mr. J. W. Adamson, chairman and managing director of British Paints (Holdings), Limited, and associated companies and president of Tyneside Chamber of Commerce. He said that the Minister of Education must view "with some concern" the failure of many companies to give better support to the Rutherford College of Technology at Newcastle-upon-Tyne.

The first diploma course there attracted only six student chemists, three of whom came from the same company, he said. "There are, I understand, a number of students who would have been acceptable, but they were not able to proceed because of lack of support from their employers," Mr. Adamson said.

NEXT THREE-DAY COURSE on oil firing, arranged by the National Industrial Fuel Efficiency Service, will be held from May 3 to 5 at Ailsa House, Kings Road, Reading. The fee for the course is six guineas and further details may be obtained from the National Industrial Fuel Efficiency Service, 71, Grosvenor Street, London, W.1 (telephone: HYDe Park 9706).

Improved Order Position of Armstrong, Stevens

DIRECTORS of the Heenan Group, Limited, in a circular to shareholders dealing with the recent acquisition of Armstrong, Stevens & Son, Limited, dropforgers and machinists, of Birmingham and Willenhall, say it was estimated by the former chairman of Armstrong, Stevens that as a result of short-time working and a reduction in sales during the first eight months of its current financial year ending March 31, 1960, profits were 40 per cent. down during the period.

The order position has recently improved, say the Heenan Group directors, and it is expected that with the support of other companies in the group, the manufacturing resources of Armstrong, Stevens will be more fully absorbed and will produce earnings to show a fair return on the capital employed.

Mr. F. C. Whitehouse has relinquished the chairmanship of Armstrong, Stevens under changes made as a result of the acquisition. He continues to be managing director. The other members of the board, with the exception of Mr. R. C. Webley, have resigned. Mr. C. L. Hill, the Heenan chairman, has been appointed chairman of Armstrong, Stevens, and two Heenan directors, Mr. F. J. Fielding and Mr. A. C. Hayes, have also joined the board.

Joint Award of James Clayton Prize

AWARD of the 1959 James Clayton Prize has been made jointly by the Institution of Mechanical Engineers to Mr. C. B. Dicksee and Prof. G. F. Mucklow. The prize is drawn from the Clayton Trust Fund and is awarded annually to the member of the institution who, in the opinion of the council, has contributed most in the year to modern engineering science.

Prof. Mucklow, who was Chance Professor of Mechanical Engineering at Birmingham University from 1940 to 1959, won the award for continuous research and experimental work into the propagation of pulses in gases, problems connected with the internal combustion engine, and for his contribution to knowledge in that field of mechanical engineering. Formerly a Lecturer in Engineering at Manchester University, Prof. Mucklow is director of the institution's Midland branch.

Mr. Dicksee received his award for his pioneering work and subsequent development and research on the high-speed compression-ignition engine, by which he has become recognized throughout the world as an outstanding authority in this field. During the last war he was seconded to the de Havilland Aircraft Company, Limited, where he was in charge of development and research of combustion chambers for jet engines.

Engineers' 42-hour Week on Tyneside

REPRESENTATIVES of the North-east Coast Engineering Employers' Association and the Tyne District Committee of the Confederation of Shipbuilding and Engineering Unions considered the application of the 42-hour working week last Friday.

After two hours' discussion the talks were adjourned —"pending advice from the national bodies on both sides"—until today (Friday).

Company News

RECORD NICKEL DELIVERIES

INCO of Canada Doubles Earnings

EARNINGS of the International Nickel Company of Canada, Limited, in 1959 reflected "one of the sharpest and swiftest recoveries in demand for nickel in the history of the industry," say Mr. John F. Thompson, chairman, and Mr. Henry S. Wingate, president, in their annual report. For the first time, the company delivered more than 300,000,000 lb. of nickel in a single year. This contrasted sharply with the 1958 deliveries which plunged from the near-record of 1957 to the lowest level for more than a decade.

Net earnings for the company and its subsidiaries for the year ended December 31, 1959, were US $85,157,000—equal to $5.83 a common share. These earnings compare with $39,665,000 ($2.71 a share) in 1958 and $86,141,000 ($5.90 a share) in 1957.

MR. HENRY S. WINGATE

Total capital expenditure in 1959 was $66,902,000, more than two thirds of which was spent on developing the new nickel project at Thompson, Manitoba. Capital expenditure for 1960 is estimated at upwards of $70,000,000.

Last year the company paid dividends of $3.00 per share, compared with $2.60 in 1958, and $3.75 in 1957. On February 1, 1960, the board raised the quarterly dividend from 65 cents to 75 cents a share and recommended for April 27 that the shares be split on a two-for-one basis. The increased dividend would be equivalent to 37½ cents a share quarterly after carrying out the split.

Rising Industrial Activity

The report says that the high nickel demand has been caused primarily by rising industrial activity throughout the world and by purchases by industry beyond immediate consumption needs in preparation for future contingencies, including the possible consequences of political disturbances affecting nickel producers in Cuba. "In 1961," the report goes on, "when our Manitoba project comes into operation, the nickel production capacity of free-world producers outside of Cuba will exceed the anticipated consumption."

The increase in nickel deliveries was matched by some increase in the company's deliveries of copper to world markets where prices averaged about 5 cents a pound higher than in 1958. Iron ore deliveries of 162,000 long tons were more than 30 per cent. higher than those in 1958.

Discussing the future, the chairman and president say: "The outlook for 1960 is for continued capacity production at our mines, smelters, and refineries. The company will continue most actively its programmes for market development and research on new and expanded uses of nickel. If the present high level of industrial activity continues, we look forward to recording another very satisfactory year."

A. A. JONES & SHIPMAN, LIMITED, manufacturers of machine and small tools, of Leicester—Trading profit recovered from £190,276 to £281,113 in 1959. The total dividend is 30 (25) per cent., with a 25 per cent. final.

SAMUEL OSBORNE & COMPANY, LIMITED, manufacturers of high-speed steel and tool steels, of Sheffield—The interim dividend for the year to July 31, 1960, is raised to 10 (7½) per cent. The 1958-59 total was 27½ (20) per cent.

UNITED FLEXIBLE METALLIC TUBING COMPANY, LIMITED—Final dividend is raised by 2½ per cent. to 22½ per cent., making a total of 35 (32½) per cent. for 1959. Group net profit is £229,734 (£232,196), after tax of £185,162 (£245,240).

ABBOTT BIRKS (HOLDINGS), LIMITED, manufacturers of tools and appliances for gas, water, and electrical undertakings, etc., of London, S.E.1—The dividend for 1959 is 15 (12½) per cent. Net profit is £30,729 (£20,399), after tax of £24,577 (£21,308).

BAMFORDS, LIMITED, agricultural engineers and ironfounders, etc., of Uttoxeter (Staffs)—The dividend is raised to 17½ (15) per cent. for the year ended September 30, 1959. The group net profit is £176,217 (£167,334), after tax of £157,399 (£151,203).

A. H. HUNT (CAPACITATORS), LIMITED, electrical condenser manufacturers, of London, S.W.18—The dividend is raised to 20 (15) per cent. for 1959, following an increase of 1½ per cent. for the previous year. The net profit is almost doubled at £215,943.

ENGINEERING COMPONENTS, LIMITED—Final dividend of 15 (12½) per cent. is announced, making 20 (15) per cent. for 1959 on an ordinary capital increased to £1,000,000 through an acquisition. Group net profits are nearly doubled at £335,471 (£174,274), after tax of £348,776 (£222,047).

NEWTON, CHAMBERS & COMPANY, LIMITED, ironfounders, etc., of Sheffield—Final dividend of 11½ per cent. is announced, making 17½ per cent. for 1959 against 16 per cent. previously. Group trading profits rose from £1,243,610 to £1,404,711 and the net profit from £436,601 to £558,097.

CORROSION TECHNICAL SERVICES, LIMITED—John Mowlem & Company, Limited, civil engineering contractors, etc., of London, S.W.1, has recently acquired 110 £1 ordinary shares in the company. This is the

total number of shares the company has issued out of its capital of 1,000 ordinary shares of £1 each.

ANGLO-SWISS SCREW COMPANY, LIMITED, of West Drayton (Middx)—The group net profit for 1959 was £63,076 (£45,698 parent only), and the final dividend is 11¾ per cent. making 16¾ per cent. (13¾ per cent. including 1¼ per cent. special interim plus capital distribution of 10 per cent. (nil) from disposal of investments).

DESOUTTER BROS. (HOLDINGS), LIMITED, manufacturers of pneumatic and electrical portable power tools, etc., of London, N.W.9—Final dividend on the ordinary and "A" ordinary shares is 1s. 2d. a 5s. share, making 1s. 6d. a share for 1959, compared with 11¼d. for the previous year. Group profits advanced to £375,030 (£294,807).

SWITCHGEAR & COWANS, LIMITED—Final dividend is raised by 2½ per cent. to 12½ per cent., making 17½ per cent. for 1959, against the equivalent—adjusting for the 100 per cent. scrip issue between interim and final—of 15 per cent. for 1958. Group trading profits were £339,055 (£282,384) and the net profit is £118,278 (£71,554), after tax of £117,580 (£112,950).

HARPER ENGINEERING & ELECTRONICS, LIMITED—The company has acquired all the capitals of Wilmot, Mansour & Company, Limited, engineers, etc., of Totton (Hants), and Selby Engineering Company, Limited, manufacturers of carriage axles, springs, and motor body fittings, etc., of Barking (Essex), in exchange for 460,000 and 95,000 Harper 1s. shares respectively.

ROBERTS, SPARROW & COMPANY, LIMITED, iron and steel stockholders and shearers, of Wolverhampton—Lists opened and closed yesterday (Thursday) for an offer for sale of 750,000 2s. shares at 6s. a share in the company. Application has been made to Birmingham Stock Exchange for permission to deal in and a quotation for the whole of the capital of 2,000,000 2s. shares.

DELTA METAL COMPANY, LIMITED—Subject to Treasury consent an agreement has been reached with McKechnie Bros., Limited, stampers and piercers, etc., of Birmingham, for an interchange of shareholdings in the companies' respective manufacturing subsidiaries in South Africa. Each subsidiary will retain its own individuality and management and the agreement does not affect the activities of the two companies or any of their subsidiaries elsewhere.

J. BROCKHOUSE & COMPANY, LIMITED, drop forgers and makers of iron and steel castings, etc., of West Bromwich (Staffs)—The offer made on behalf of the company by Philip Hill, Higginson, Erlangers, Limited, to acquire the 574,710 5s. ordinary shares of Albion Drop Forgings Company, Limited, not already owned by the company has been accepted by the holders of more than 88 per cent. of the shares. The offer is now unconditional and will remain open for acceptance until further notice.

FLUIDRIVE ENGINEERING COMPANY, LIMITED—A further loan of £80,000 has been obtained from the Industrial & Commercial Finance Corporation. This raises the total secured loan from ICFC to £250,000. Record sales output was achieved in the year to September 30, 1959, exceeding 1957-58 by 35 per cent. The intensive effort to raise production, reduce the work backlog, and generally shorten deliveries was, perhaps, the year's biggest advance, states the chairman, Mr. J. F. Perry.

DAVID BROWN CORPORATION, LIMITED—Consolidated profits for the year ended June 30, 1959, were £167,598 (£703,336) after a special credit received by way of compensation of £100,000 (nil) was brought in. The directors state that abnormally heavy expenditure on research, the development of new products, and the reorganization of certain manufacturing divisions have materially affected the results. As in previous years, it is not proposed to recommend the payment of any dividend on the ordinary.

HILGER & WATTS, LIMITED, scientific instrument makers, of London, N.W.1—For the year ended September 30, 1959, group profits were £126,575 (£112,754). The effective dividend total remains at 15 per cent., with proposed one-for-five scrip issue and one-for-four rights issue at 21s. per 5s. share. A 15 per cent. dividend total is expected on increased capital for 1959-60. The chairman, Mr. G. A. Whipple, says that the order rate which continues to increase exceeds present output and that extensions are being made.

THOMAS LOCKER & COMPANY, LIMITED, parent of the group of woven wire manufacturers and general engineers, etc., of Warrington (Lancs)—The company proposes to change its name to Thomas Locker (Holdings), Limited, and to act solely as an investment holding company. The group's manufacturing and selling activities will be undertaken by the subsidiaries. It is also proposed to convert the ordinary 1s. stock units into 1s. shares, so as to avoid confusion between the two classes—at present ordinary stock and non-voting "A" ordinary shares.

CLARKSON (ENGINEERS), LIMITED, of Nuneaton—As forecast a total of 20 per cent. for the year to November 30, 1959, is maintained on capital increased by a one-for-three scrip issue, with a 12½ per cent. final. This represents an effective rise of 5 per cent. in the total. A further scrip issue, on a one-for-four basis, is proposed and if profits are maintained the board intends to pay the present rates of 7½ per cent. interim and 12½ per cent. final on the increased capital for 1959-60. This would mean an effective increase of 4 per cent. on 1958-59.

C.V.A. JIGS, MOULDS & TOOLS, LIMITED—There were increasing demands for the products of the company, said the chairman, Sir John Eldridge, on Tuesday in his statement covering the nine months to September 27, 1959. There was a profit before income tax of £65,297 compared with £84,320 for the full year 1958. A dividend of 1½ per cent. less tax is declared on the ordinary shares for the period, compared with 2 per cent. for 1958. The meeting agreed that the name of the company should be changed to Kearney & Trecker-C.V.A., Limited.

MORPHY-RICHARDS, LIMITED, makers and distributors of electrical appliances, of Orpington (Kent)—One-for-one scrip issue is being made and an 8 per cent. interim dividend will be paid on the increased capital (5 per cent. equivalent). Group turnover in the six months ended December 31, 1959, increased by about 25 per cent. over the corresponding 1958 period to about £6,500,000. Before tax, profits exceeded £650,000, an increase of 39 per cent. The chairman, Mr. F. P. Bishop, says in an interim report that tax will require at least half the balance, leaving a net profit equal to 5 per cent. of the turnover.

W. G. ALLEN & SONS (TIPTON), LIMITED—Although net results of subsidiaries for the first half of the financial year showed a satisfactory profit, the parent company's loss exceeds these profits, so that the group as a whole made a small loss, says the chairman, Mr. Robert Hampshire, in an interim report. Orders received during the past four months have substantially exceeded output and there is now about six months' work in hand, but he warns that narrow margins have had to be quoted. Because of difficult trading conditions the interim on the ordinary was passed last month. On account of 1958-59, holders received a total dividend of 15 per cent., including two 2½ per cent. interims.

African Notes

STEEL RATIONED

ISCOR's Temporary Measure to Meet Demand

RATIONING " rears its ugly head " again in South Africa. This time it is being applied by the South African Iron & Steel Industrial Corporation, Limited, which has had to put its customers on an allocation basis since the beginning of the year in order to make available steel supplies go round. Long-standing export orders are being fulfilled, but further orders have not been accepted since last September. The position, however, is expected to approach normal by the third quarter of this year, when increased capacity at both the Pretoria and Vanderbijlpark works comes into operation.

Iscor's customers have been rationed on the basis of their best performance over a period, the allocation varying from product to product, depending on the ability of the company to meet the requirement. The system of allocation has proved difficult to work out, but performance over a long period was taken as a yardstick as this was thought to be more likely to reflect true demand. Iscor considers that the present demand is still in excess of true local demand.

A new record has been set up for Sierra Leone's iron-ore exports. For 1959 the tonnage shipped was almost 1,600,000 tons, the previous record being for 1957 when nearly 1,500,000 tons was shipped.

Minerals Developments

Large deposits of high-grade iron ore, now being mined 400 miles inland from Mossamedes, Southern Angola, are expected to enable the Portuguese authorities to justify their huge expenditure in recent years on the Mossamedes railway. The companies mining the ore at Cassinga and Cuima are now negotiating contracts with German and American companies for the export of the ore.

The mines want the railway to transport 1,500,000 tons of iron ore a year and if contracts are signed according to plan, the mining concerns are seeking to build a special terminal for ocean-going ships at Mossamedes to handle the ore exports.

Exclusive prospecting orders have been granted to three companies, covering over 518 square miles of Southern Rhodesia. Messina (Rhodesia) Development Company, Limited, has been granted an exclusive prospecting order for all precious metals and base minerals over 460 square miles until the end of 1964, during which time £125,000 must be spent on operations in the reservation. Tateguru Copper (Pvt.), Limited, must spend £18,000 on operations in the next two years in 48 square miles, in which it exclusively may prospect for base minerals. Rio Tinto (S.R.), Limited, is to spend £7,500 searching for precious metals in the next two years in over 10 square miles of the Hartley mining district.

The Government has also given permission for a detailed survey of about one square mile in the area of the Khami Dam, Bulawayo, to find out whether copper deposits there are worth developing.

The value of output of minerals in Southern Rhodesia in 1959 reached a total of £25,003,364, Mr. C. J. Hatty, the Minister of Mines, has announced. Asbestos again topped the list of individual minerals with an output of over £7,000,000, although this was a considerable reduction on the corresponding figures for 1957 and 1958. Copper production increased by 100 per cent. last year, reaching a value slightly in excess of £2,000,000. Chrome, at £3,000,000 (a considerable reduction on 1958), was exceeded by coal, the output value of which was £3,800,000.

Values of exports of South African minerals in 1959 (with 1958 values in parentheses) were as follow:—Chrome ore, £2,795,029 (£2,985,120); lead-ore concentrates, £6,451,932 (£6,498,143); manganese ore, £3,624,040 (£5,143,482); copper bar and blister, £8,973,109 (£8,086,772); asbestos, £10,656,801 (£10,428,314); coal, £1,288,945 (£1,694,147).

Work is to begin shortly on a new mineral quay at Lourenço Marques harbour at an estimated cost of £525,000.

After a period of eight months' prospecting deposits of good quality bauxite, estimated at over 500,000,000 tons, have been found in the Tchabes, Lake Assom, Partapet, and Ngaoundal districts of Adamawa, Northern Cameroons. Prospecting for iron ore on the Ivory Coast has now been extended to the coastal area between Bandama and the Ghana frontier. The programme is being financed jointly by the European Coal and Steel Community and the Overseas French Mining Bureau.

In spite of the depressed coal market, Bubye coalfield, about 50 miles west of Beitbridge, has been explored by New Consolidated Goldfields, Limited. It is stated that its investigation has reached the stage of proving sufficient reserves to contemplate the establishment of a colliery to produce good quality coking coal. Transport is proving the major difficulty at present.

The name of Prof. F. S. Atkinson, who has occupied the Chair of Mining at Sheffield University since 1954 and who is president of the Midland Institute of Mining Engineers, has been mentioned as a member of the judicial commission of inquiry into the Coalbrook Colliery disaster. If he serves, he will probably be one of at least two assessors appointed to assist the chairman, a Supreme Court judge, who is still to be named.

MICROCELL, LIMITED—Mr. W. A. Bartlett has been appointed an executive director.

Non-ferrous Metals

Value of International Tin Quota System

CUSTOM smelter price for copper in the States was reduced by 2 cents a pound to 33 cents a pound at the end of last week. The former quotation of 35 cents a pound became untenable when the scrap price was dropped to 24¼ to 24½ cents a pound—equivalent to an electrolytic price of around 30 to 30½ cents a pound for delivery three months forward. Thus the outlook is for still cheaper copper. Much depends on Wall Street which has been behaving badly in recent weeks and should the present downward trend be reversed it could have a very beneficial effect on demand for non-ferrous metals. The US producers' price is unchanged at 33 cents a pound.

Although London had been expecting the US price reduction, when it came it caused the cash price to dip below £250 a ton. However, selling pressure in London is not heavy and with low stocks of refined metal in LME warehouses the market is holding up reasonably well. The outlook is for a continuation of the present downward trend in the price, but this should come about in a gentle and orderly fashion unless and until supplies of available metal rise rapidly.

Tin has been one of the main centres of interest in non-ferrous markets following the communiqué issued by the International Tin Council. The council has raised the export quotas of producer countries from 36,000 tons to 37,500 tons in the April-June quarter. By itself this announcement seemed somewhat curious as stocks of tin available to the market are not burdensomely large, but the explanation is that certain countries cannot now fill their quotas and despite the rise of allowable production the ITC is expecting only 35,500 tons to be offered in the April-June quarter. Tin, therefore, is more or less back to normal, but the council continues to exercise a useful function in maintaining the quota system to prevent stocks, which have been built up in certain countries, being dumped on the market.

London took the announcement, together with the explanation, in its stride and there was not much change in the price. Singapore liked the decision and the eastern quotation turned harder. America was a bit unsettled, but now that the announcement is out of the way it is hoped that the market will become steadier. At present the New York price is fluctuating between $1.00 to $1.01 a pound.

Lead continues to plough an even furrow. The London price is holding up well at a shade over £75 a ton and the outlook is for a continuation of this trend. Demand is satisfactory and supplies, although adequate, are not burdensome. There are, however, reports that supplies are building up slightly on the Continent. In the US, demand is reasonably good and the price is 12 cents a pound.

Zinc continues to be a good market on both sides of the Atlantic. Overall demand is satisfactory and the outlook is good. In London the price is trying to break through the £90 a ton level while in the US it is firm at 13 cents a pound.

Official metal prices in London yesterday (Thursday) were:—COPPER, Standard: Prompt £250, forward £236. TIN, Standard: Prompt £791, forward £790 10s. LEAD: Prompt £76 10s., forward £75 12s. 6d. ZINC: Prompt £89 10s., forward £88 5s.

Increased Traffic for South Wales Ports

TONNAGE of traffic through South Wales ports in February was 1,406,156, an increase of about 149,000 on the total for February last year. Among the major increases in inward traffic was in iron ore, which rose from 272,175 to 388,028 tons, but other ores slumped from 22,091 to 6,259 tons. Iron and steel goods imported rose from 5,606 to 13,367 tons. Total inward traffic rose by about 149,000 tons to 871,193 tons.

At 534,963 tons, outward traffic was almost the same as last year. Iron and steel manufactures dropped from 68,166 to 30,378 tons. Shipments of coal, coke, and patent fuel totalled 224,606 tons, a slight increase on last February. Tinplate increased from 34,399 to to 47,420 tons.

Total tonnages handled by the various ports so far this year (with equivalent 1959 tonnages in parentheses) are as follow:—Newport, 391,561 (380,049); Cardiff, 354,560 (340,085); Barry, 217,893 (218,906); Port Talbot, 501,699 (362,853); Swansea, 1,325,325 (1,153,360); Penarth, 69,318 (75,513); Lydney, 4,928 (4,219).

Engineers to Recommend New Pay Claim

APPLICATION for a general wage increase will be recommended to the annual conference of the Confederation of Shipbuilding and Engineering Unions at Llandudno in June. This was decided at a meeting in York on Thursday last week of the executive council of the confederation. The meeting also decided to apply immediately for an increase in the wages of apprentices.

A month ago, the confederation accepted a cut of two hours in the working week to 42 hours to come into effect on March 28.

After the meeting, Mr. Frank Foulkes, president of the confederation, spoke of the pay claim for apprentices. "We shall pursue it vigorously," he said. The plan was to settle the apprentice question free of the complications which might arise if negotiations for a general increase were going on.

ZINC MINING PROJECT IN QUEBEC

NEW zinc mining project in the Lake Mattagami area of north-western Quebec will cost $50,000,000, according to the Premier, Mr. A. Barrette. The project will be carried out by Mattagami Mines, financed by Noranda Mines, McIntyre Porcupine Mines, and Canadian Exploration.

The plant contemplated will handle 2,000 tons daily, taking ore from property discovered in 1957 and having a 25,000,000-ton deposit of zinc, copper, silver, and gold. Zinc will account for about 25 per cent. of the deposit. Underground work and construction of the ore concentrating plant are expected to cost $25,000,000 and the refining plant $30,000,000.

STAY-DOWN STRIKE by 13 colliers at Bargoed Colliery (Glam), the outcome of a pay dispute, ended on Thursday of last week. The men returned to the surface after being below ground for more than 30 hours.

IRON AND STEEL TRADE

BRITISH steelmakers are operating in a carefree atmosphere. New output records are achieved every month and for the first time ever the industry is turning out crude steel at an annual rate of 25,000,000 tons. Mr Edward Senior, commercial director of the British Iron and Steel Federation, has been emboldened to remark—even before the year's first quarter is through—that the target of 24,000,000 tons for the whole of the year looks absolutely assured.

Further expansion, stimulated as it is by restocking, may be kept within narrow limits, but demand is becoming more evenly spread. Until recently the main emphasis of demand was for light steel products, but the heavy section and plate mills have latterly come more prominently into the picture. On the north-east coast, which specializes in these products, the February output was nearly 60 per cent. greater than it was a year ago.

The continued prospect of full or nearly full employment for the steel plants has enabled the industry to regard with equanimity the possibility of an early rise in railway freight rates. Such an advance could probably be absorbed by the more efficient plants whose earnings are the determining factor in the fixing of selling prices. But inflationary influences predominate and buyers appear to recognize that there is no advantage and certainly an element of risk in delay in securing coverage for forward requirements.

Pig-iron

During the past three months the annual rate of pig-iron production has increased by approximately 1,100,000 tons, and although steelworks stocks were eroded to the extent of about 300,000 tons in the second half of last year the works still have sufficient pig-iron in hand to meet any emergency.

The imminent liberation of the icebound ore-loading ports promises more ample supplies of imported ore and the removal of the last obstacle to the further expansion of pig-iron production which has already become necessary.

Ferro-alloys

After remaining unchanged in price since January 18, there has now been a reduction of 4d. per lb. in the price of ferro-tungsten. The new price is 11s. 8d. per lb. W. contained, and that of tungsten metal powder is now 14s. 8d. per lb. However, there would still appear to be a reasonably steady call on supplies of ferro-tungsten.

There is still a good demand for the major grades of ferro-silicon, while ferro-chrome and ferro-manganese are quite active. Calcium silicide is in fair request, and the more specialized demand for ferro-sulphide and ferro-phosphorus is at a good level.

Ferro-niobium and ferro-titanium are receiving moderate support, and while there is a fair demand for ferro-vanadium, ferro-molybdenum is quite active.

Semi-finished Steel

The position in the semi-finished steel trade is substantially unchanged. The rising production of billets, blooms, and slabs is sufficient to provide for the bulk of the requirements of the sheet and re-rolling mills.

As still greater capacity will soon become available, the import of relatively small tonnages from western Europe may be regarded as no more than a temporary expedient.

Finished Steel

To the general reports of booming trade in finished products there are still a few exceptions. Makers of railway equipment in the form of rails, tyres, wheels, and axles are still operating on a hand-to-mouth basis and competition for the few orders available is intense. Specifications for colliery material are also very scarce, but with the exception of these sectors the industry is on the crest of the wave.

The motor industry—by far the biggest user of sheets—maintains a high rate of demand, but the position may become easier, as domestic production this year is expected to be stepped up. The tonnages of heavy sections and plates on order exceed the most sanguine expectations, but delivery dates are not unreasonable.

Favourable Outlook for Canadian Steel Industry

CANADIAN steel industry is continuing to operate at high capacity levels this year. For the first two months ingot production rose 24 per cent. to 1,100,000 tons, compared with 888,385 tons in the corresponding period a year ago. Pig-iron production during the same two months rose almost 26 per cent. to 731,950 tons from 581,926 tons.

This trend was echoed by Mr. M. S. Fotheringham, president of Steep Rock Iron Mines, Limited, when he told shareholders that 1960 should be an excellent year.

Provided that the United States' steel production reached an anticipated 120,000,000 tons this year, Steep Rock should have highly favourable shipments, he said. With the first production to come from the Caland mine, leased by the company to the Inland Steel Company, shipments of iron ore from the Steep Rock range in north-western Ontario should also establish a record.

£4,000,000 Orders for English Electric

ORDERS together worth well over £4,000,000 were announced by the English Electric Company, Limited, on Wednesday. The larger, valued at nearly £2,500,000, is for hydro-electric generating plant for two new Spanish power stations, and was won against strong European competition. Delivery of the equipment will start in 1961.

The other order was placed by British Railways and is for 20 more 2,000-h.p. Type 4 diesel-electric locomotives. No value for this order has been given, but the locomotives are believed to cost around £90,000 each.

Coal Board's Appliance Credit Scheme

SPEAKING at a Press conference on Tuesday, Mr. R. H. E. Thomas, marketing member of the National Coal Board, pointed out that coal was "still the cheapest form of heating in the home." It was in an effort to awaken the public to the economic attraction of coal that the board had arranged with Forward Trust, Limited, a subsidiary of the Midland Bank, Limited, to introduce a new loan scheme—not, Mr. Thomas emphasized—a hire purchase scheme.

The oil industry, he said, had had 12 months to mount its campaign while the solid fuels scheme had been prepared in a much shorter time. The plan would be backed by an extensive advertising campaign which would start on Sunday.

Loans are offered for all modern domestic solid fuel fired appliances; for central heating installations in dwelling houses and commercial premises such as office blocks, flats, and shops and for small industrial installations such as laundries.

The scheme will replace an old credit terms plan which involved paying a deposit and interest at 7½ per cent. Under the new scheme any appliance costing more than £20 can be installed upon payment of the first monthly instalment (no deposit) and paid for over two years with a fixed charge for interest of £5. If it costs more than £50, the appliance can be paid for over five years with interest charged at 5 per cent. If Bank rate changed, the interest would probably be altered, but a customer would continue to pay at the rate fixed when he started buying his appliance.

There is no ceiling on the price of equipment which can be bought this way. Examples of likely purchases and repayments are:—Convector fire costing £20 (including installation), 5s. a week over two years; boiler supplying seven radiators and domestic hot water costing £380, 36s. 6d. a week over five years; installation costing £550, 53s. a week over five years.

NCB OFFER TO PRIVATE MINE OWNERS

PROPOSALS to cut the coal output of privately owned small mines next year are to be re-examined by the National Coal Board. This offer, which does not affect the board's plans to cut the output of these mines this year, was made on Tuesday at a meeting in London between the board and officials of the Federation of Small Mines of Great Britain.

The federation has expressed dissatisfaction with proposals that output should be cut from 2,600,000 tons in 1959 to 2,000,000 tons this year. Small mines are licensed by the board to about 500 private owners. Further reductions, to 1,750,000 tons, were proposed next year, and to 1,500,000 tons in 1962. Tuesday's offer is to be considered by the federation.

AN AGREEMENT between the Vanderbijl Engineering Corporation, Limited, of South Africa, and Rubery, Owen & Company, Limited, manufacturing and structural engineers, of Wednesbury (Staffs) for the production of motor car parts has led to the formation of a company with a capital of £1,500,000 of which Vanderbijl will hold 51 per cent. and Rubery Owen the balance.

Coalbrook Company Wins Appeal: Mine Re-opens

NEWS that mining operations were to be resumed immediately at Clydesdale Colliery, Coalbrook, Orange Free State, where 435 miners died in January, came 24 hours after the Government decision to close it on Monday because of further rock movement. The commission appointed to consider the company's appeal against the close-down sanctioned the immediate resumption of mining operations in both seams with the introduction of increased safety measures.

The disaster inquiry, which resumed on Monday, was adjourned again until next Wednesday after Mr. W. T. Dalling, South Africa's assistant Government mining engineer, nominated to assist magistrate Mr. P. J. Vanheerden, had described rescue work as "the biggest blunder and bungle I ever heard of." Mr. J. A. Maisels, QC, representing the mine management, said that if Mr. Dalling continued to sit on the inquiry, the mine management "will avail itself of every privilege allowed by law in order to remove him."

Mr. Dalling replied: "If anyone did intend to put me off the inquiry I thought I would make this public statement and let people know." In this statement Mr. Dalling said the whole rescue effort, apart from that by certain teams and technicians, was "a complete bungle because no one appreciated the implications of subsidence. I went down a pilot hole to the mine on March 10, and was amazed and shocked to find firedamp pressure extremely high."

Mr. Maisels described the statement as "farcical, scandalous, impertinent, and untruthful."

Night Overman Killed by Runaway Pit Tub

NIGHT overman at Pleasley Colliery (Notts) died in hospital after being struck by a runaway tub which crashed through one of a set of ventilation doors he was about to open from the other side, a Mansfield inquest jury was told on Tuesday. A verdict of Accidental Death was returned on Mr. Harry Johnson (59).

It was stated that the tub broke away from a set of four while one of them was being righted after becoming derailed. The wheels of the other two had been locked for safety, and the men on the spot did not know that the end tub had broken loose until they heard of the accident.

The coroner, Mr. C. A. Mack, said there was no breach of regulations and no negligence.

Winston Electronics Becomes US Group Subsidiary

WINSTON ELECTRONICS, LIMITED, of Shepperton (Middx), has become a wholly-owned subsidiary of the Dynamics Corporation of America. The merger terms include payment in cash plus a large block of DCA stock in return for the total shares, privately held, of Winston Electronics.

Under long-term contracts Mr. F. Winston Reynolds will continue as chairman and managing director, Mr. Roger Laurence as director of research and technical director, and Mr. Joseph Samuels as works director. Mr. T. Anderson leaves the board.

Obituary

Mr. George Wood

EXPERT ON IRON AND STEEL SCRAP

AFTER a long illness, the death took place on Monday of Mr. George Wood, vice-president of Thos. W. Ward, Limited, and a well-known member of the iron and steel trade. He was 76. He was an acknowledged expert on iron and steel scrap and shipbreaking and in the early years of the last war was Director of Scrap Iron and Steel Supplies to the Iron and Steel Control. He was a past-president of the Yorkshire Scrap Iron, Steel and Metals Association and a past vice-president of the British Shipbreakers Association.

Mr. Wood joined Thos. W. Ward as a boy in 1897, was appointed a local director in 1919, a director in 1923, and assistant managing director in 1928. In 1941 he became joint managing director and deputy chairman, and in 1950 he was appointed chairman of the company. Four years later, feeling the necessity for taking a less active part in its affairs, he relinquished the chairmanship to become vice-president.

During his 57 years with Thos. W. Ward, Mr. Wood was chairman or managing director of a number of its subsidiaries, having given up these posts only in the last few years. He had served as chairman of Milford Haven Dock & Railway Company and had been a director of the British Iron & Steel Corporation (Salvage), Limited, which played a prominent part in salvaging marine scrap during the last war.

He was made CBE in the 1951 Birthday Honours in recognition of his many years' service to his country and to industry.

MR. T. L. TAYLOR

THE death occurred on Wednesday of Mr. Tom Launcelot Taylor, for many years a leading figure in the engineering industry, and president of Yorkshire County Cricket Club. He was 81. Until several years ago, Mr. Taylor was chairman and managing director of Taylor Bros. & Company, Limited, steelmakers, etc., of Manchester. He was at one time chairman of the Metropolitan Carriage, Wagon & Finance Corporation, Limited, formed by Cammell Laird & Company, Limited, and Vickers, Limited, of which he was also a director. He had also served on the board of the English Steel Corporation, Limited.

As a batsman, Mr. Taylor played regularly for Yorkshire from 1899 until 1906 and he was a member of Lord Hawke's team which visited Australia and New Zealand in 1901-02.

MR. B. G. KING

FOR many years a well-known figure in the wholesale coal trade, Mr. B. G. King died suddenly on Tuesday. Mr. King, who traded in Bristol under his own name, was for some time a colliery agent, and also had an interest in briquette manufacturing. In recent years he had operated under an agency arrangement with Lunt Bros., of Birmingham, mainly in the shipping section and more especially in the Channel Islands trade. He also carried on an extensive shipment business in limestone, chalk, and bricks.

Mr. King, who was 81, was a keen worker on behalf of the Coal Trade Benevolent Association.

Mr. THOMAS ERNEST HULL, managing director and secretary of Lead Pipes, Limited, Elland (Yorks), has died at the age of 75.

Mr. B. J. COLEY, a director and joint founder of the Birmingham firm of Coley Brothers (Tools), Limited, has died at the age of 45.

Mr. J. W. JESSOP, whose death is announced, was a director of William Jacks & Company, Limited, metal merchants, etc., of London, E.C.2.

The death has occurred of Mrs. M. E. JENKINSON, a director of C. I. Jenkinson & Son, Limited, manufacturers of engineers' small tools, etc., of Sheffield.

Mr. FREDERICK CHARLES FRANKLIN, who from 1919 until he retired in 1945 was managing director of Whitfield Hodgson & Brough, Limited, shoe repairing machinery manufacturers, of Kettering, has died at the age of 81.

The death has occurred at the age of 53 of Mr. JOHN ARTHUR DENTITH, assistant purchasing officer for the North-Eastern Divisional Coal Board. For a number of years prior to nationalization he was in the purchasing department of Amalgamated Denaby Collieries, Limited.

Oldest member of the Dawdon Miners Lodge, Seaham Harbour (Co. Durham), has died at the age of 93. He was Mr. CUTHBERT ADAMSON, who started work at the age of 12 in Low Moorsley pit where he became a deputy. He transferred to Easington Colliery in 1912 and two years later went to Dawdon. He was a shotfirer when he retired 23 years ago at the age of 70.

Recent Wills

LLEWELLIN, W. M., for many years manager of Coegnant Colliery, Caerau, South Wales ...	£1,884
RAISTRICK, JAMES, former director of James Raistrick & Sons, Limited, ironfounders, of Accrington ...	£4,194
DAVISON, T. B. M. (TOM), managing director of Robert Peel & Company (Pudsey), Limited, sheet-metal workers, etc.	£4,496

Coal Output Comparison With 1959

COAL output is now running at almost 6 per cent. below the comparable 1959 total. For the first 10 weeks of the year deep-mined output is 4.1 per cent. below last year's figure and open-cast output is 36 per cent. down. Last week there was a slight falling-off to 3,922,000 (3,929,800) tons in deep-mined output, but open-cast production remains fairly static at about 170,000 tons.

Consumption, in spite of a pronounced drop compared with the previous week, was, at 4,395,000 tons well above last year's figure of 4,158,000 when the trade recession and the unusually mild weather was hitting the coal industry severely. Consumption is still about 300,000 tons above output and there is a consequent drain on stocks, now down to 32,815,000 tons—the figure for mid-September last year.

There were 621,200 wage-earners on colliery books on March 5, against 674,000 on March 7, 1959, the numbers engaged at the coal face being 238,200 and 262,300, respectively. Total absenteeism (all workers) in the week ended March 5, was 15.37 per cent., compared with 17.02 per cent. in the week ended March 7, 1959. Output at the face was 3.979 tons and overall 1.413 in the week ended March 5, compared with 3.774 and 1.373 in the week ended March 7, 1959.

The following table gives (in tons) the output of saleable mined coal by division in the week ended March 12, and the tonnage lost through all causes (holidays, disputes, and go-slows):—

Division.	Week ended March 12, 1960.		Week ended March 14, 1959.
	Total output.	Tonnage lost.	Total output.
Scottish	373,300	1,700	387,700
Northern (N & C) ..	242,900	—	261,000
Durham	476,700	1,700	490,900
North-Eastern ..	844,400	14,300	866,600
North-Western ..	267,900	300	299,800
East Midlands ..	925,700	—	920,300
West Midlands ..	298,000	100	329,300
South-Western ..	412,800	8,800	434,300
South-Eastern ..	30,400	—	33,600
Great Britain—			
Deep-mined coal ..	3,872,100	26,900	4,023,500
Other deep-mined (including licensed mines) ..	49,900	—	56,900
Open-cast coal ..	170,100	—	244,000
TOTAL	4,092,100	26,900	4,324,400

WEST RIDING MINERS' PERMANENT RELIEF FUND

URGING continued and extended support, the West Riding Miners' Permanent Relief Fund in its annual report issued on Monday states: "The objects for which the society was established are as necessary today as they were 83 years ago."

The number of contributing members last year was 16,967. Contributions received under the old scheme account were £3,073, a decrease of £37, while contributions received under the fatal accident section amounted to £2,985, a decrease of £102.

The revenue of the society for the year amounted to £17,703, and the expenditure was £8,125. The amount paid in benefits for both sections was £5,690, compared with £5,542 in 1958.

Duke of Edinburgh Emphasizes Importance of Coal

NEW department of mining at the University College of South Wales and Monmouthshire, Cardiff, was formally opened by the Duke of Edinburgh last Friday. Among those who greeted the Duke were Mr. T. A. Rogers, HM Chief Inspector of Mines (representing the Ministry of Power), Mr. C. A. Roberts (representing the National Coal Board), and Prof. John Sinclair, head of the department.

Welcoming the Duke, Dr. Anthony Steel, vice-chancellor of the university, said that the mining department had produced nearly 18 generations of graduates in mining engineering. It had become well-known for its research work, particularly in devices for the improvement of safety measures in the South Wales coalfield since the war.

Replying, the Duke of Edinburgh hinged his remarks on the NCB's "Revised Plan for Coal" which he said fully recognized that the basis of a growing industrial civilization would for a great many years to come depend upon coal. Almost every country in the world was undergoing industrialization in some form or another. The basic material of such industrialization was steel and, he said, "it is hardly a risky guess to predict that the demand for steel will continue to increase for a good many years."

The NCB revised plan was encouraging, but it could not hope to succeed unless the industry could call upon enthusiastic and competent administrative and technical talent.

The mining department through its atmosphere and teaching should be the nerve centre of the whole industry. He did not suppose that any college or department of the university had so direct an influence upon the industry and economy of South Wales. It was graduates from the department who would have to see that the money to be invested in the industry was spent without waste, who would to a large extent be responsible for the increase in productivity, and who would have to bring humanity and understanding to the industrial relations both within the industry and between the industry and the community.

"South Wales as a whole and the coal industry in this area in particular are on the threshold of a new era and it is up to you to give a lead. You've got a fine new building and the industry has a new plan. Now it is up to you to get on with it," the Duke concluded.

Apprentices' Low Standard of Mathematics

APPRENTICES of a Loughborough firm of crane makers failed engineering examinations because of a low standard of mathematics, said Mr. H. Flavell, a director of the company, Herbert Morris, Limited. In the national engineering courses, he said, there was a 100 per cent. pass at higher level but a low pass proportion at ordinary level.

Mr. Flavell, who was speaking at the firm's annual award distribution for apprentices last week, said his company was keen to absorb local school-leavers. "But we feel we are entitled to a certain standard of training," he added. After the "creaming off" of school-leavers, the balance left to local industry should be suitably trained. "The alternative is to seek outside the area for more suitable material," he said.

Personal

Former Fuel Minister Returns to Private Industry

MR. AUBREY JONES, Conservative MP for Hall Green (Birmingham), has joined the boards of Courtaulds, Limited, rayon yarn spinners and manufacturers, of Bradford, and the Guest Keen Iron & Steel Company, Limited, Cardiff. He will also act in an advisory capacity to the GKN group on economic affairs.

MR. AUBREY JONES

Mr. Jones, who is 48, became Minister of Fuel and Power at the end of December, 1955, after five years with the British Iron and Steel Federation. He had been appointed assistant director of the federation in 1950 and its economic director in 1954. He has served as a member of the Conservative Fuel and Power Committee and when, in 1957, Lord Mills became Minister of Power, Mr. Jones succeeded Mr. Reginald Maudling as Minister of Supply.

At the General Election last autumn he indicated that he did not seek further office as he wished to return to private industry.

Mr. A. MORLAND, group mechanical engineer with the Durham Divisional Coal Board, has been installed as chairman of the North-Eastern branch of the Institute of Plant Engineers.

Mr. DENNIS W. HEATH, managing director of Samuel Heath & Sons, Limited, stamped brassfounders and finishers, etc., of Birmingham, has been appointed Consul for Greece at Birmingham.

Mr. REGINALD N. SMITH, a member of the clerical staff at Darfield Main Colliery, Wombwell (Yorks), has been elected president of the north-eastern area of the Clerical and Administrative Workers' Union.

Presentation was made on Monday to Mr. OLIVER BARROW, a departmental manager with Gent & Company, Limited, manufacturing electrical engineers, of Leicester, to mark the completion of 50 years' service with the company.

Field-Marshal Sir WILLIAM SLIM has been appointed an additional member of the board of Imperial Chemical Industries, Limited. He will act as a non-executive director. This is the fourth directorship Sir William has accepted since February.

Mr. W. N. COLLINS, assistant managing director of F. Perkins, Limited, diesel engine manufacturers, of Peterborough (Northants), has been elected chairman of the marine section of the Society of Motor Manufacturers and Traders in succession to Lt. Cmndr. J. W. Thornycroft.

Sir HARRY MELVILLE, secretary of the Committee of the Privy Council for Scientific and Industrial Research since 1956, will receive an honorary D.Sc. at Birmingham University degree Congregations on July 15 and 16. Sir Harry was Mason Professor of Chemistry at the university from 1948 to 1956. Two new Birmingham University appointments have been announced. Mr. J. T. DAVIES, university lecturer in Chemical Engineering in Cambridge University, has been appointed to the Chair of Chemical Engineering and to the headship of the Department of Chemical Engineering from October 1, next. Mr. D. R. MILNER has been appointed Lucas Fellow in Metal Joining in the Department of Industrial Metallurgy.

Major W. R. BROWN, chairman and managing director of the Power-Gas Corporation, Limited, since 1957, is retiring at the end of this month. Major Brown joined the firm more than 30 years ago, became a director in 1942, vice-chairman in 1956, and managing director in the following year.

After a five months' oversea business tour, Mr. W. L. MATHER, a director of Mather & Platt, Limited, engineers, etc., of Manchester, has returned home. Among countries he visited were Greece, Turkey, Lebanon, Persia, Pakistan, India, Siam, Malaya, Australia, New Zealand, the Philippines, Hongkong, Japan, Hawaii, and the United States.

Presentations to two managers of Mappin & Webb, Limited, cutlery manufacturers, of Sheffield, each of whom has over 50 years' service with the firm, were made last Friday by Mr. J. C. Gardiner, a director of the parent company, Sears Holdings, Limited. They were Mr. W. H. GILBERT, the general manager, and Mr. S. F. HOWELL who is in charge of the Sheffield showroom.

Sir LESLIE ROWAN, who is a director of Vickers, Limited, has been appointed to the board of Barclay's Bank, Limited. Sir Leslie, who is also a director of Vickers-Armstrongs, Limited, and of Robert Boby, Limited, manufacturing engineers, etc., of Bury St. Edmunds (Suffolk), was Second Secretary of the Treasury at the time of his retirement from the Civil Service in 1958.

Mr. HERMAN LINDARS, the Sheffield industrialist, and director of the Sheffield Philharmonic Society, conducted the Royal Philharmonic Orchestra in Leeds Town Hall on Sunday. Mr. Lindars is vice-chairman and managing director of Dunford & Elliot (Sheffield), Limited, and its subsidiary, Clay Rolling Mills, Limited, and a director of Dunford & Elliot Process Engineering, Limited, and of Herman Lindars, Limited.

Mr. W. C. HESELWOOD, president of the Sheffield Metallurgical Association and head of the physics section at the Swindon laboratories of the United Steel Companies, Limited, is on a three weeks' visit to Japan. He is the deputy-leader of the British delegation to the third international conference on non-destructive testing now being held in Tokio. On his return journey, Mr. Heselwood will visit research laboratories in Hongkong, Bangkok, and India.

On his retirement recently, presentations were made to Mr. D. TOPPING, manager of Hafod Colliery, near Wrexham (Denbighshire), since 1952. He began his career in the Lancashire coalfield, working at Old Boston, Golborne, and Lyme collieries before going to Englefield Colliery in the late 1920s. He subsequently became manager of Black Park Colliery and a director of the company, continuing in charge of the colliery under nationalization until it was closed in 1952.

President of the Coal Trade Benevolent Association for 1960-61 will be Lord REA, a director of R. & J. H. Rea, Limited, London, E.C.3, and of Rea, Limited, Liverpool, and other companies, and Liberal Leader of the House of Lords since 1955. Mr. PHILIP CLARKE, a director of Rea, Limited, has been elected chairman of the association, and Mr. JOHN CHARRINGTON, a joint managing director of Charrington, Gardner, Locket & Company, Limited, has been elected deputy chairman.

In Parliament

Mr. Macmillan Urged to Tour Coalfields

SUGGESTION that the Prime Minister toured the country's major coalfields in view of the present anxiety in the industry was made by MR. WILLIAM HAMILTON (Lab.). He said that "with the best will in the world," the Prime Minister could not appreciate the problems of miners and their families unless he visited the areas. "If he can find time to visit Africa," Mr. Hamilton went on, "surely he can find time to visit the centres of this great industry and at least give the people in them some assurance about their future."

MR. MACMILLAN said the Government was well informed about the problems and prospects of those in the industry, but feared he could not undertake such a tour at present. However, six of the nine divisions had been visited during the last four months by either the Minister of Power or the Ministry's Parliamentary Secretary.

He added that he had great confidence in the knowledge and sympathy of the Minister. "One satisfactory aspect of the matter is that, broadly speaking, the reduction in the size of the industry and the men employed has been carried out so far largely by normal wastage and by non-recruitment, and, to a large extent, those thrown out have been found alternative occupations."

MR. JAMES GRIFFITHS (Lab.) asked whether the Prime Minister was aware that "those of us" from mining constituencies thought there was a very sharp contrast between how this matter had been handled under nationalization and how it was handled by private enterprise in the '30s. MR. MACMILLAN said he did not think Mr. Griffiths was entitled to make that point. "What we are trying to do is to ensure that, if this is an industry that has to shrink for technical reasons, we are able by all these various measures, the latest of which is the measure just passed by this House, to find alternative occupations," he said.

Plans for Apprentice Training

REFERENCES to the recent inquiry by the British Employers' Confederation on apprentice training and the Government's proposed apprenticeship courses were made during Question Time on Monday. MR. PETER THOMAS, Parliamentary Secretary to the Ministry of Labour, described Press announcements of the Government's scheme as "both premature and unauthorized."

Answering MR. AUSTEN ALBU (Lab.), MR. THOMAS said discussions were proceeding with both sides of industry and that a statement would be made as soon as they were ended.

He told MR. REGINALD PRENTICE (Lab.) that all industries were asked last year by the Industrial Training Council to assess their future training needs. Many foresaw a need to increase their intake though they felt unable to make precise forecasts. Mr. Thomas then referred to the British Employers' Confederation inquiry, to which 154 leading undertakings had indicated they would substantially increase their intake of boys into skilled occupations during 1961, 1962, and 1963.

MR. PRENTICE said that these 154 firms were only about half the number of firms approached by the confederation. He asked whether the Government would itself try an accurate survey to ascertain how far industry was likely to supply the needs of the extra number of school-leavers. Mr. Thomas said he did not think there would be much value in duplicating activities in which the ITC and the BEC were already engaged.

LURGI PLANT EMPLOYMENT

LIKELY decline in those employed on the Lurgi plant, at Westfield (Fife), was referred to by MR. WILLIAM HAMILTON (Lab.). He said that the figure of 750 now employed there would probably drop to about 200 in October and that within one year there would be 1,100 fewer jobs in the mining industry in East Fife. Mr. Hamilton asked whether Central West Fife could be included on the list of places eligible for aid under the terms of the Local Employment Bill.

The PARLIAMENTARY SECRETARY TO THE BOARD OF TRADE, Mr. John Rodgers, said he was aware that the numbers employed on the construction of the Lurgi plant would decline during the year, and that there would be fewer jobs available in the mining industry. He would keep a close watch on the position.

Answering a further question by Mr. Hamilton, MR. RODGERS said that if the position in Dunfermline deteriorated, the Board of Trade would naturally consider adding it to the list.

BOARD TO REORGANIZE RAILWAYS

WARNING that while the Government accepted the objective underlying the Guillebaud report others must also accept corresponding obligations was given by the Prime Minister in the House on Thursday of last week. The railway industry must be of a size and pattern to suit modern conditions, the railway system must be remodelled and modernized, and some increases would have to be made in fares and charges, he said.

A special planning board would work out details of a radical reconstruction of the British Transport Commission based on decentralization of management and full self-accounting for regions and other individual BTC undertakings.

LOANS TO PRIVATE FIRMS

WHENEVER public money is lent to private firms, the Government considers all appropriate methods of safeguarding the national interest, said the CHANCELLOR OF THE EXCHEQUER, Mr. Heathcoat Amory. In reply to MR. JOHN DUGDALE (Lab.), the Chancellor said he would not expect Government representation on the boards of companies desirable or necessary for this purpose, except in very exceptional circumstances.

Asked by MR. DUGDALE the principles on which the Treasury acted in deciding whether to lend money to private firms, the Chancellor replied that this was done exceptionally and only where the public interest justified it.

DISCUSSIONS ARE in progress between the Board of Trade and the Pressed Steel Company, Limited, over the company's site extensions in the North-east, said the Parliamentary Secretary to the Board of Trade, in reply to Mr. Fergus Montgomery (Con.). The Parliamentary Secretary added that discussions had not reached the stage at which it was possible for him to make a statement.

THE COAL TRADE

DEMAND remains steadier than the vagaries of the weather and in the domestic sector it would seem that in many parts of the country consumers are now keeping stocks topped up rather than getting so low that they have to bombard merchants with urgent orders. The problem of railway transport from the pithead does not appear to have been completely solved, but it is now much less acute than a week or two ago. The industrial demand for all fuels, so long delayed, is now building up, but has still a long way to go to reach pre-recession levels.

SOUTH-WEST LANCASHIRE

Trade in domestic fuel is erratic, but supplies of house coal are satisfactory. There are delays in the delivery of some qualities owing to wagon shortages, but the tonnage which is available is sufficient to meet current needs. "Coalite" continues to maintain a popular market and supplies are satisfactory. The one real difficulty in domestic distribution is the shortage of anthracite nuts. "Phurnacite" and "Phurnacite" screened nuts are available promptly.

The gas coke market shows signs of easing, since many of the larger buyers of coke have stocks in hand which they are now using. The demand for both hard and gas coke qualities for general industrial purposes is maintained at a steady level and orders are executed promptly by both road and rail transport. There is also a good demand for other types of steam-raising fuel, particularly the small sized fuels.

Coastwise trade from the Merseyside ports is much reduced. The following are the average prices (per ton) of household coals:—Group 1, 202s. 8d.; Group 2, 183s. 3d.; Group 3, 166s. 5d.; Group 4, 154s. 8d.; Group 5, 141s. 7d.; Group 6, 131s. 5d.; Group 7, 117s.

YORKSHIRE

The better grades of domestic coal are likely to be attractive for some time to come and generally there has been little easing up in the flow of orders to merchants. Success in winning contracts for solid fuel that might otherwise have gone to oil have given considerable encouragement to the trade.

Industrial furnace cokes continue in great demand and future prospects are equally as good.

The "Anomaly" of Mine Rescue Services

ANOMALOUS position of men in the mines rescue service was referred to on Thursday of last week by Mr. W. H. Sales, chairman of the North-Eastern Divisional Coal Board. Speaking at the annual dinner and dance of the Doncaster and District Mines Rescue Station, Mr. Sales said they were most appreciated when they were not performing their real function.

"These men are always on call," he went on, "and we have to take into account that in a very large measure their service is a dedicated one. We cannot separate safety from rescue and I always believe any industry which attaches great regard to safety is better than the one which disregards this aspect."

Mr. Sales presented long-service medals to 52 members of rescue teams and the rescue competition shield to Harworth No. 2 team. Retirement certificates were also presented to 13 members whose length of service ranged from seven to 19 years.

Reduction Checked in ECSC Coal Stocks

COAL output in the European Coal and Steel Community reached 19,658,000 tons last month, against 20,183,000 tons in January, and 19,113,000 tons in February, 1959. The recent rapid fall in pithead stocks slowed down in the first three weeks of February, and by February 21, stocks stood at 30,471,000 tons—about 200,000 tons lower than at the end of January.

This fall is almost entirely due to reductions of German stocks of 170,000 tons to 11,020,000 tons. Small reductions were reported from Italy and Holland, but French stocks rose by 54,000 tons to 11,230,000 tons and those of Belgium by 15,000 tons to 7,370,000 tons.

The High Authority of the ECSC has issued a comparative list of coal prices as at the beginning of March, based on an index of 100 for Ruhr prices. Prices include:—Anthracite—Aachen 117, Holland 109, Belgian syndicate sales 136, Belgian independent sales 116, Nord and Pas de Calais 101. Non-coking coal—Aachen 111, Holland 120, Belgian syndicate sales 143 (148 in January), Calais 114. House coal—Aachen 107. Fine bituminous coal—Aachen 110, Saar 108, Belgium 112, Calais 92, Lorraine 94. Coke—Aachen 109, Saar 114, Holland 98, Calais 100, Lorraine 109. Steam coal quality 2—Saar 109, Belgium 112, Calais 107, Lorraine 106. Steam coal quality 5—Saar 98, Belgium 105, Calais 104, Lorraine 95. Semi-bituminous coal—Holland 109, Belgian syndicate prices 112, (116 in January), Belgian independent sales 116, Calais 101.

The president of the High Authority, Signor Malvestiti, last week held talks in Bonn with Dr. Adenauer on coal market difficulties in Germany and the reorganization of Ruhr coal sales through a centralized market.

Scottish Miner Lost Life in Roof Fall

MINER described at a Kirkcaldy (Fife) inquest recently how he and a colleague were buried by a roof fall underground at Wellesley Colliery on February 24. His colleague, Mr. George Bell (52), was asphyxiated.

Mr. Henry Selfridge said there was no warning of the fall. He was buried, but still had room to breathe before being dug out about 90 minutes later.

The colliery manager, Mr. William McAllister, said there was a more than adequate number of roof supports underneath the fallen stone. On a visit to the scene about a month previously, he found the method of support in accordance with his wishes and with the Mines Regulations. The jury returned a formal verdict.

Orders Placed

Simon-Carves to Build £3,000,000 Factory in India

CONTRACT to build a complete new factory to make about 51,000 tons a year of compound fertilizers based on ammonium phosphate has been received by Simon-Carves, Limited, from the East India Distilleries & Sugar Factories, Limited. The total cost is expected to be in the region of £3,000,000.

In addition to the compound fertilizer plant, the factory, which is to be built at Ennore, near Madras, will include plants for production of synthetic ammonia, sulphuric acid, and phosphoric acid, together with equipment for handling incoming raw materials.

MINISTRY OF AVIATION contract worth £6,000 for transistor testers, has been placed with Avo, Limited, of London, S.W.1, a member of the Metal Industries Group.

REACTOR FLUX scanning equipment has been ordered by Atomic Power Construction, Limited, for the Trawsfynydd nuclear power station, from Elliott Nucleonics, Limited.

TWO LARGE 60/90 semi-mobile asphalt plants will be despatched from the Leicester factory of Goodwin, Barsby & Company, Limited, within the next two months to the Limmer & Trinidad Lake Asphalt Company, Limited.

ORDERS FOR four NEM-Götaverken diesel engines for British and Norwegian owners have been received by the North Eastern Marine Engineering Company, Limited, a member of the Richardsons, Westgarth & Company, Limited, group.

THE GERMAN COMPANY of Brown-Boveri, Limited, has secured a £1,300,000 order to build high-tension power lines for the Malayan Central Electricity Board. The company has also won an order worth about £850,000 for high-tension lines in Persia.

ELECTRIC TRACTION EQUIPMENT worth almost £2,750,000 is to be supplied by Associated Electrical Industries, Limited, to South African Railways. Most of the equipment will be manufactured at the Trafford Park, Manchester, and Sheffield factories of the company.

ORDERS WORTH about £3,000,000 for two 8,000-ton cargo motorships, for service in the New Zealand trade have been placed with Clyde shipyards. One of the freighters will be built by Alexander Stephen & Sons, Limited, of Glasgow, and the other by John Brown & Company, Limited, Clydebank.

CIVIL ENGINEERING WORK, a steam generating plant, buildings, and ancillary equipment are included in a contract worth £145,000 awarded to Mitchell Engineering, Limited, of Peterborough, by the UK Atomic Energy Commission for work to be carried out at Windscale. The work is due to be completed in October.

IN THE FIRST two months of the current year, Mirrlees, Bickerton & Day, Limited, of Stockport, a member of the Hawker Siddeley Group, Limited, has received orders for 35 marine engines worth £480,000. Of these, 28 are repeat orders. The engines are to be installed in various types of marine craft including trawlers, tankers, passenger and cargo vessels, tugs, and dredgers.

REPEAT ORDER from Johannesburg Municipality has been received by the General Electric Company, Limited, for two further 60-mW. turbo-generator sets, complete with feed heating plant, for Kelvin "B" power station. The order is valued at more than £1,250,000. With this latest contract, the number of GEC sets on Johannesburg's four power stations will be 27, providing over 750,000 kW.

CONTRACTS WORTH ABOUT £23,000 have been placed by British Railways with two Lanarkshire firms. The larger, in the region of £17,000, goes to the Motherwell Bridge & Engineering Company, Limited, for the renewal of steel superstructure of an underbridge at Dumfries and the other, for the strengthening of steel trough deck at Burntisland Viaduct, has gone to the Lanarkshire Welding Company, Limited, Wishaw.

CHEMICAL CONSTRUCTION (GB), LIMITED, has recently been awarded two major contracts worth a total of £650,000 by the newly formed Albatros Sulfuric Acid & Chemical Works, Vlaardingen, Holland. The projects involve a very large complex sulphuric acid contact plant designed to take SO_2 gas from pyrites and from a unique plant of Chemico design which is to decompose 56 per cent. sulphuric acid refinery sludge.

ORDER FOR 22,000,000 plastic water bags, worth £165,000, has been placed by the East Midlands Divisional Coal Board with Commercial Plastics, Limited, of Wallsend (Northumberland), and Albert Green (Plastics), Limited, of Derby. The bags are to be used in a new method of shotfiring devised by Mr. William Wood, the division's safety engineer. It is claimed that the use of water-filled plastic bags will cut down the risk of fire and practically eliminate dust and fumes after firing.

TWO MEMBER COMPANIES of the Power-Gas Corporation, Limited, group—Ashmore, Benson, Pease & Company Africa (Pty.), Limited, Johannesburg, and P. G. Engineering, Limited, Stockton-on-Tees, are to carry out an order valued at over £1,000,000 for the Rhodesia Broken Hill Development Company, Limited. It is for a zinc and lead I.V. furnace which will be installed at Broken Hill, Northern Rhodesia. The contract includes the engineering, procurement, and construction of the whole of the plant within the furnace area covering foundations, plant, and equipment. Process design is being supplied by Imperial Smelting Processes, Limited, and on completion at the end of 1961, the plant will be one of the first four operating in the world.

North British Locomotive's Net Loss

GROUP net loss for 1959 of £1,349,566 is reported by the North British Locomotive Company, Limited, Glasgow. There was a loss of £909,512 in the previous year. The loss, which is after all charges, includes provisions for losses on contracts £462,306 (£103,158), and elimination of administration expenses from work-in-progress £251,399 (nil). It is also after tax credits of £3,295 (debit £126). Group loss attributable to the holding company is £1,348,726 (£910,529).

Last ordinary dividend was 5 per cent. for 1955 and the preference is in arrears from January 1, 1956. Last October, holders were told there was "a great deal to be done" to bring the company to rights. The directors believed this could and would be effected, but holders were warned not to expect any dividend in 1959 and "maybe nothing for two or three years."

IRON AND STEEL and petroleum products are to be imported by India from Russia under letters signed on Monday, embodying trade arrangements for 1960.

NEWS IN BRIEF

ANOTHER LARGE CARGO of iron-ore amounting to about 30,000 tons is due in the river Tyne on April 14. It is being brought from Puerto Ordaz in the ore-carrier Ore Prince.

THE Glasgow office of Turner Bros. Asbestos Company, Limited, has been moved to 80, York Street, Glasgow, C.2. The telephone number and telex address remain unchanged.

IN ADDITION TO dividends under a co-partnership scheme due at the end of the month, the Cundall Folding Machine Company, Limited, of Luton (Beds), announces a bonus for employees averaging £135.

STEEL PRODUCTION in the USA this week is estimated by the American Iron and Steel Institute at 2,597,000 tons, compared with 2,654,000 tons (revised) for last week and 2,631,000 tons in the corresponding week of last year.

THE BODIES of 12 of the 18 miners entombed for a week four miles along a seam at a West Virginia colliery, US, have been located. It is believed that the remaining six have also perished further along the same working.

ASHBY WOULDS URBAN DISTRICT COUNCIL is to accept an offer by the National Coal Board of £6,250 in full and final settlement of its claim for compensation for damage caused to 16 houses at Moira by mining subsidence.

AT THE ANNUAL MEETING of the South-Western Division of the British Association of Colliery Management Mr. W. D. Jones was elected chairman, Mr. D. W. Roderick, vice-chairman, and Mr. Roland Griffiths, treasurer.

FIRST BULK DESPATCH of tractors from the Meltham Works of David Brown & Sons (Huddersfield), Limited, to the Oliver Corporation of Chicago went by a special train, carrying 49 tractors, to Manchester Docks on Thursday of last week.

AREA ENGINEERS from 11 branch offices attended a recent sales course at the Wimbledon works of Foster Transformers, Limited, now a member of the Metal Industries Group. Guest of honour was Sir Charles Westlake, chairman of the group.

SHEFFIELD FIRM of metal merchants, H. Kitson Vickers & Sons, has bought three squadrons of 67 Royal Naval Air Service fighters for dismantling. It is believed to be the first time complete aircraft have been bought for scrap in Sheffield.

THE TOKEN STRIKE staged on every Monday for the past month by 80 platers at the Sunderland shipyard of Austin & Pickersgill, Limited, against the dismissal of one of their shop stewards, ended on Monday when the men resumed normal working.

MORE THAN 120 fitters and labourers at the Wallsend dry docks of Swan, Hunter, & Wigham Richardson, Limited, ship builders and repairers, etc., have been paid off. It is expected that the men will be reinstated shortly as further repair work is due.

ABOUT 140 men who have been working a four-day week at the Stockton-on-Tees forge of Head, Wrightson & Company, Limited, for the past two months, have resumed full-time working. The restricted working was started because of a shortage of orders.

SWINHOPE (Northumberland) lead-ore mine which was to have been closed down by Consolidated Goldfields of South Africa, Limited, is to carry on in production under its new owners, Settlingstone Mines, Limited. The mine manager, Mr. A. Treloar, stated: "There is still plenty of metal and it is an ideal proposition for a medium-sized company. The mine could employ 100."

THREE WELDED STEEL storage tanks, 9 ft. in diameter and 30 ft. long, with a 12,000-gallon capacity, have been completed for an industrial heating installation at Newton Mearns, near Glasgow, by Hillside Foundry & Engineering Company (Cupar), Limited.

NEARLY 70,000 ft. of galvanized Dexion slotted angle has been sent to Agadir by the War on Want organization. The cost of transportation has been met by the Dexion, Limited, group, which has offered to fly a technical adviser to Agadir, free of charge.

DURING HIS PRESENT VISIT to Spain, Mr. Cass, chief engineering representative of the Export-Import Bank of Washington, is visiting various steelworks which have applied for credits to the Export-Import Bank to finance the modernization of their installations.

FORMATION of an Electronics Industry Council was announced in London on Monday by the Electronic Engineering Association, who, with the Radio and Electronic Component Manufacturers' Federation, and a number of other bodies, has been discussing this for some time.

ACCEPTANCES have been received in respect of over 90 per cent. of the issued shares of Nico Light Engineering Company, Limited, by General and Provincial Investment Trust, Limited. Its offer has been declared unconditional and the period for acceptance has been extended to tomorrow (Saturday).

GOVERNORS OF North Staffordshire Technical College have recommended that the name of the college should be changed to the North Staffordshire College of Technology. It is felt that the size of the college, the expansion being carried out, and the amount of advanced work undertaken justify the step.

POSSIBILITY OF INVESTING $200,000,000 in expanding the El Teniente (Chile) copper production and subsequently a larger sum for modernization of the entire plant is said to have been the reason for a three-day visit to Chile by Mr. Charles Cox, president of the Kennecott Copper Corporation, of the USA.

TO ENABLE the entire staff to be housed in one centre the headquarters of the Nobel division of Imperial Chemical Industries, Limited, is to be moved from Glasgow to Stevenston (Ayrshire), near the division's largest producing factory at Ardeer. The transfer is to be phased and will take two and a half years.

FOLLOWING EXTENSIVE exploration by Colvilles, Limited, on a deposit of limestone at Hardendale Nab, near Shap (Westmorland), a Glasgow company is to undertake large-scale quarrying. The limestone is suitable for metallurgical purposes and the project will involve the laying down of modern crushing plant and the installation of a railway siding.

AFTER TWO AND A HALF YEARS of exhaustive investigations the establishment of an oil-from-coal industry in the Federation of Rhodesia and Nyasaland is considered to be economically impracticable at present, states the Wankie Colliery Company, Limited, South Africa. Two schemes were considered and the capital costs of both left no margin for distribution costs or any profit.

MANAGEMENT of the Cleveland Twist Drill Company, Limited, has ended the usual factory system of clocking in and out. It is said their workers are so keen that time checking was found to be unnecessary. No-

one was ever late and no-one tried to slip away before the 5.30 p.m. finish. Number of hours worked are still recorded, but for clerical and overtime reasons only.

ALMOST THE entire production force of 150 workers at the Coventry plant of Mulliners, Limited, the Birmingham car body building subsidiary of Standard-Triumph International, Limited, was on Monday dismissed. The men said they received an hour's notice and a week's pay. The parent body said later that a contract between Mulliners and itself for the partial supply of Vanguard bodies had been terminated. Later there were indications that some of the men may be reinstated within the group.

WORLD-WIDE first-quarter net sales for Massey-Ferguson were $87,900,000, compared with $82,500,000 for the same period a year ago, an increase of 6.5 per cent., said Mr. A. A. Thornbrough, president at the annual shareholders' meeting in Toronto last week. Before taxes, profit was $2,285,000 ($3,747,000). North American sales increased 8 per cent., European sales were about the same as last year, but African, Asian, and Latin American sales increased. Mr. Thornbrough announced expansion and rearrangement of French tractor facilities. Fourfold expansion of the former Standard-Hotchkiss plant at Beauvais is to be completed early in 1961.

Big Extension to GKN Tremorfa Works

EXTENSION costing £1,350,000 to the steel rod mill of Guest, Keen, & Nettlefolds (South Wales), Limited, at Tremorfa Works, Cardiff, will increase output by 100,000 tons a year to 350,000 tons. Another 50 workers will be added to the company's 3,200 employees at the Tremorfa and Castle works, Cardiff.

The company claims that on completion of the scheme next year, the mill will be one of the most modern and efficient of its kind in the world. The extra output will go towards the requirements for finished products in the company's own works and to home and oversea customers.

The Tremorfa mill rolls billets from the nearby steelworks of Guest, Keen Iron & Steel Company, Limited, another member of the GKN Group. Companies in the group use the rod for making wire, nails, nuts and screws, and reinforcing rod.

EASIER BORROWING NOW FOR STEEL INDUSTRY

STEEL industry was proud that £100,000,000 a year was being spent on developments, said Mr. G. H. Latham, chairman and managing director of the Whitehead Iron & Steel Company, Limited, at a staff dinner at Cardiff last Friday. "Now that nationalization has gone—we hope for ever—the steel industry's position is being rendered much easier by our ability to borrow money at a reasonable rate to proceed with our developments," he said.

"We have never distributed more than 50 per cent. of the profits we have made, and very often considerably less. We have pursued the provident course of ploughing back into our business more than half our profits, with the results that we are now in the happy position of not requiring any new money to make our works more modern."

Coal Stocks Position

DETAILS of coal stocks as at March 5, 1960, compared with those available at March 7, 1959, are given in the appended table issued by the Ministry of Power.

Figures in parentheses, mainly calculated on the basis of requirements during the winter, indicate the total weeks which the tonnage in stock would last.

Week ended:—	March 5, 1960.	March 7, 1959.
	Thous. tons.	Thous. tons.
Distributed stocks—		
Public-utility undertakings—		
Gas	1,931 (3.6)	2,267 (4.2)
Electricity	5,346 (4.8)	6,346 (6.0)
Railways	362 (1.8)	579 (2.7)
Coke ovens	1,484 (2.9)	1,376 (2.8)
Industrial consumers—*		
Iron and steel	220 (1.9)	227 (2.0)
Engineering and other metal industries	283 (3.1)	311 (3.5)
Other industries	1,723 (3.0)	1,815 (3.2)
TOTAL INDUSTRIES	2,226	2,353
Merchants' stocks—		
(*a*) House coal	779	855
(*b*) Anthracite and boiler fuel	142	96
Miscellaneous (estimated)	257	351
TOTAL DISTRIBUTED STOCKS	12,527	14,223
Undistributed stocks—		
At collieries (on ground and in wagons)	26,302	14,317
At open-cast sites	6,513	5,681
TOTAL UNDISTRIBUTED STOCKS	32,815	19,998

* Excluding stocks held by the smaller consumers of less than 1,000 tons per annum.

Oil or Coal? Each Case on Its Merit at Edinburgh

EDINBURGH Corporation has no specific policy to change from coal to oil burning, it was disclosed at a meeting of the corporation's works committee last week. The city architect said that his department took no decision on a proposal for a major change until the National Coal Board's technical advisory service had been consulted.

Mr. N. Wilson, engineer and manager of the lighting and cleansing department, told the committee there was no question of an overall policy to change from coal to oil. Every project was considered on its merits, he said.

The discussion arose from the receipt of a letter from the National Union of Mineworkers expressing grave concern at a proposal to convert a boiler house for a garage and workshop from coal to oil firing. Letters were also received from the Scottish TUC general council and the NCB, both urging local authorities to continue using coal for heating new schools and for other big developments that may be planned or under consideration.

DAVIS & TIMMINS, LIMITED—Mr. B. P. Jenks has been appointed to the board.

The Scrap Markets

Deliveries Improving

WITH the advantage of milder weather and longer hours of daylight scrap merchants have been able to step up their deliveries to the steelworks. The rise in consumption still outpaces the supply of all grades suitable for furnace charges, particularly for heavy cast-iron and machinery scrap.

Scotland—Business throughout the West of Scotland continues on similar lines to the last few weeks. With the lengthening hours of daylight and the milder weather conditions it is now possible to go ahead with outside work and it is expected that the tonnage will expand over the next few weeks. The steelworks are still working to capacity and in consequence are keeping up their demand for heavy steel and basic scrap. In view of the high production rate merchants are being constantly pressed to augment their deliveries.

The production of steel turnings remains fairly constant and regular consignments are going forward to the various consuming works. The output of cast-iron borings is well up to average.

The black spot on the market is the foundry trade where, unfortunately, firms are not so well placed for work as the steelmakers.

Cleveland—Traders are assured of ready outlets for light as well as heavy material. The cast-iron scrap market shows less resilience and merchants have less difficulty in providing for the needs of the iron-foundries than they have in satisfying the considerable demand from the steel foundries and refined-iron works for No. 1 short heavy steel scrap.

Lancashire—Steady trading conditions continue to be reported in most sections of the Lancashire iron and steel scrap markets. A good aggregate tonnage of cast scrap materials is being taken up by the foundries. Supplies of textile machinery metal are still being made available, but the scrapping timetable under the cotton trade reorganization scheme expires at the end of this month and a gradual tapering off in the tonnage coming on to the market is expected before very long. Steel-melting scrap is said to be in reasonably good supply and a steady demand from the steel mills is reported.

South Wales—Demand is constant and merchants are receiving daily calls for scrap in order that the present high rate of output may be maintained. Steelmakers and ironfounders find themselves with no stocks of scrap on the ground, and it is fast coming to the stage when they are working on a day-to-day basis. Imports of scrap are of an extremely poor quality, but demand is so urgent, that these cargoes are being accepted. The market is very active.

Non-ferrous Metal Prices

(Delivered, unless otherwise stated)

Copper—Solid-drawn tubes, 2s. 5½d. per lb.; rods, 263s. 6d. per cwt. basis; 20 s.w.g., 298s. 6d. per cwt.

Brass—Solid-drawn tubes, 2s. 0d.; sheets up to 10 w.g., 215s. 9d. per cwt.; wire, 2s. 9½d.; rolled metal, 215s. 9d. per cwt.

Lead Sheets, etc.—Sheets, £112 15s.; pipes, £115 per ton.

Zinc Sheets, etc.—Sheets, 15 g. and thicker, ex works, English destinations, £123 17s. 6d.; rolled zinc (boiler plates), ex works, all English destinations, £121 12s. 6d.; zinc oxide (Red Seal), d/d buyers' premises, £100 per ton.

Other Metals—Nickel, £600. Aluminium ingots, £186. Antimony, English, 99 per cent., £190. Quicksilver, ex warehouse, £70 10s. to £71. Bismuth (per lb.), 16s. nom. (1-ton lots). Cadmium, 10s. per lb. Magnesium ingots (per lb.), 2s. 2½d. to 2s. 3d.; notched bar 2s. 9½d., powder 6s. 1d. Platinum, per oz. (troy), £30 5s.

Change in ECSC Charter

SUPPORT has been given by the European Court of Justice to an alteration to be made in the charter of the European Coal and Steel Community. The alteration (to Article 56) provides for the extension of compensation to workers affected by certain economic cutbacks within the ECSC, the admission of all ECSC workers, instead of only mineworkers, to the scheme, and the possibility that such compensations will be paid during the validity of the charter.

This decision in effect rejects the claim by Federal Germany that such an alteration would be contrary to the ruling of Article 95 of the charter. On the same day, the court rejected an appeal by Federal German authorities against a decision by the High Authority in December, 1958, concerning the lifting of special transport tariffs on iron ore and fuel for the iron and steel industry.

The German Government had claimed that the Authority's instructions to Germany to remove these tariff advantages were not directly binding.

Europe's Top Foundry Apprentices to Compete in Midlands

THREE apprentices to represent Britain in the European Foundry Apprentice Competition at Wolverhampton and Wednesbury during the week May 23-27, will be chosen from the six finalists in the British National Foundry Apprentice Competition. The six are: K. T. Cawser and C. F. Corbett, both of F. H. Lloyd & Company, Limited, Wednesbury; A. Elliot, Darlington Forge, Limited; R. Morley, Bradley & Foster, Limited, Darlaston; W. N. Styles, W. & T. Avery, Limited, Walsall; and T. J. Vincent, Hamworthy Engineering, Limited, Poole.

Other countries entering apprentices are France, Germany, Holland, and Sweden, and probably Austria, Belgium, Denmark, Italy, and Switzerland.

Ferro-alloy Prices

(Per ton, unless otherwise stated, delivered)

FERRO-SILICON (6-ton lots and over)—45 per cent. Si, £41 10s. to £44, scale 15s. per unit, lumpy; 75 per cent. Si, £57 to £62 10s., scale 15s. per unit, lumpy.

FERRO-VANADIUM—50/60 per cent., 22s. 6d. per lb. of V.

FERRO MOLYBDENUM—65/70 per cent., carbon-free, 12s. 10d. per lb. of Mo.

CALCIUM MOLYBDATE—12s. 4d. per lb. of Mo.

MOLYBDIC OXIDE BRIQUETTES—11s. 10d. per lb. of Mo, delivered United Kingdom.

FERRO-BORON—23/25 per cent., 7s. 6d. per lb.

FERRO-TITANIUM—20/25 per cent., 2-3 per cent. Cu, £250; 38/40 per cent., commercially carbon-free, £287.

FERRO-TUNGSTEN—80/85 per cent., 11s. 8d. per lb. of W.

TUNGSTEN METAL POWDER—98/99 per cent., 14s. 8d. per lb. of W.

FERRO-CHROME (6-ton lots and over, lumpy)—4/6 per cent. C, £78 10s. to £82 10s., basis 60 per cent. Cr, scale 26s. to 28s. 6d. per unit; over 6 per cent. C, £77 to £80 10s., basis 60 per cent. Cr, scale 26s. to 28s. 6d. per unit; max. 2 per cent. C*, 1s. 8d. to 1s. 11d. per lb. Cr; max. 1 per cent. C*, 1s. 8½d. to 1s. 11½d. per lb. Cr; max. 0.15 per cent. C*, 1s. 9½d. to 2s. 0½d. per lb. Cr; max. 0.10 per cent. C*, 1s. 9¾d. to 2s. 0¾d. per lb. Cr; max. 0.06 per cent. C*, 1s. 10¼d. to 2s. 1d. per lb. Cr.

METALLIC CHROMIUM—98/99 per cent., 6s. 10d. per lb.

METALLIC MANGANESE—94/96 per cent., carbon-free, £275; 96/98 per cent., £285.

FERRO-COLUMBIUM—65/67 per cent., Cb+Ta, 19s. 9d. per lb., Cb+Ta.

FERRO-MANGANESE (home)—78 per cent., £63 10s.

* *Average 68-70 per cent. Cr.*

Coalfield News

MINERS AT Easington Colliery (Co. Durham) who went on strike on Friday last, returned to work on Sunday night.

THE NATIONAL COAL BOARD has bought a 12¼ acre farm near Shirland Colliery (Derbyshire), for £1,200, to give more storage space for coal and colliery spoil.

Mr. RAY KIRK (26), a filler at Clifton Colliery (Notts), has been selected for the Great Britain basketball team for the Olympic Games qualifying rounds in Bologna, Italy, in August.

MEMBERS OF THE CRAFT CENTRE for disabled miners at Pontefract (Yorks) are to present a rug made at the centre to Mr. Paul Robeson, the singer, whose intended visit to the centre was cancelled because of the death of Mr. Alwyn Machen, Yorkshire miners' president.

TRIUMPHAL PROCESSION headed by the Hatfield Colliery Band was accorded to Mr. James Musgrave, the 37-year-old glassmaker who won the John o'Groats to Land's End walking race, when he returned home to the mining village of Dunscroft, near Doncaster.

OUTWARD SHIPMENTS of coal, coke, and patent fuel from Grimsby in February dropped to 20,287 tons from 55,368 tons for the same period last year. At Immingham total shipments, including coal, coke, and patent fuel, were 397,590 tons compared with 283,805 tons.

A TOTAL of 95,279 tons of coal was shipped through the port of Garston during February, of which 72,512 tons went to Northern Ireland, 19,660 tons to Eire, and 3,105 tons to the Isle of Man. The month's coke shipments totalled 3,384 tons—613 tons to Northern Ireland and 2,771 tons to foreign destinations.

TOTAL OUTPUT in the West Midlands Division of the National Coal Board last month was 1,200,000 tons, 144,000 tons, or 10.5 per cent. below the figure for the corresponding period last year. For the first eight weeks of the year, output was 2,500,000 tons, 270,000 tons, or nearly 10 per cent. less than a year ago.

OFFICIAL RECEPTION was held at Bilsthorpe Miners' Welfare (Notts) on Wednesday evening for Mr. Alf Rozentals (31), the Bilsthorpe Colliery miner who came third and won £250 in the recent John o'Groats-Land's End marathon walk. Mr. Rozentals was presented at the reception with money raised for him by fellow miners.

NATIONAL JUNIOR cross-country title over a six miles course was won at West Bromwich on Saturday by Tony Walker (19), an apprentice fitter at Parkhouse Colliery (Staffs). As a result of this achievement, he has been chosen to run for the English Cross Country Union against the Combined Services at RAF Henlow on April 2.

TO MARK HIS RETIREMENT from the Wombwell Main Colliery (Yorks) on Saturday, Mr. John Harper received a presentation from Mr. George Galloway, Group "A" manager, South Barnsley Area of the North-Eastern Divisional Coal Board. Mr. Harper has been safety officer for 12 years and was previously a deputy and overman for 22 years.

MINISTRY OF TRANSPORT is making a special investigation into the lack of railway wagons to move coal in Yorkshire. This is being done at the request of Mr. John Osborn (Con.), who has told Mr. John Hay, Parliamentary Secretary, of the letter he and other MPs had received from Yorkshire colliery managers "praying" for action to move the coal and keep the pits open.

TEN TEAMS TOOK part in the Central East Area junior ambulance competition of the Scottish Divisional Coal Board at Harthill (Lanarkshire), recently. Results: 1 Polkemmet Colliery "A" (475 pts.); 2 Riddochhill Colliery (406); 3 Eastern Colliery "A" (400). The winner and runner-up will compete in the Scottish divisional finals in Glasgow. Members of Polkemmet "A" team won the four individual prizes.

MINER WHO SWAM into the rough sea at Ryhope (Co. Durham) in a bid to rescue a nine-year-old boy received the vellum testimonial of the Royal Humane Society for his "great courage," at Sunderland County Magistrates' Court on Monday. The miner, Mr. Henry Ruddick (45), of New Silksworth, dragged the boy to the shore and gave artificial respiration, but the boy died later in hospital. Mr. Ruddick is only a moderate swimmer.

PITHEAD BATHS costing £110,000 were opened on Saturday at Linton Colliery (Northumberland). The baths cater for 1,500 miners and have facilities for drying clothes and boot cleaning. There is also a fully equipped medical centre. The opening ceremony was performed by Mr. C. Bewick, general manager of the Northern Northumberland Area of the Northern (N&C) Divisional Coal Board. New pithead baths built at Longhirst Colliery, are to be officially opened tomorrow (Saturday).

TEAMS FROM Grimethorpe Colliery led both sections of the eliminating round for the Wood Shield in an ambulance competition at Royston recently arranged by No. 4 (Carlton) Area, of the North-Eastern Divisional Coal Board. Second in each section were teams from South Kirkby Colliery, and third places were taken by Monckton Nos. 1 and 2 pits and Houghton Main. Grimethorpe provided seven of the 18 men selected for the Area final of the Peake Cup individual competition, at Grimethorpe on March 30. Prizes were presented by Mr. A. Brookes, Area production manager.

Local Authority Urged to Delay Smoke Control Action

MEMBERS of Rotherham Borough Council were on Tuesday asked to delay enforcing smoke control orders in some affected parts of the town until the National Union of Mineworkers could reach agreement with the National Coal Board on the issue of an alternative concessionary fuel. The appeal was made by Mr. L. Silverwood, miners' representative on the local Trades Council.

He said that since 1952 members of the Aldwarke branch of the union had given two loads of coal a year to old-age pensioners, widows, and the sick. "Now the Clean Air Act has come into operation in certain wards in Rotherham, these old men and women cannot burn their coal. If they leave it at the pit they cannot get a halfpenny for it."

Trades Council chairman, Cllr. Jack Moran, said it was likely that the Labour Group would be asked to initiate a 12-month standstill on smoke control offences.

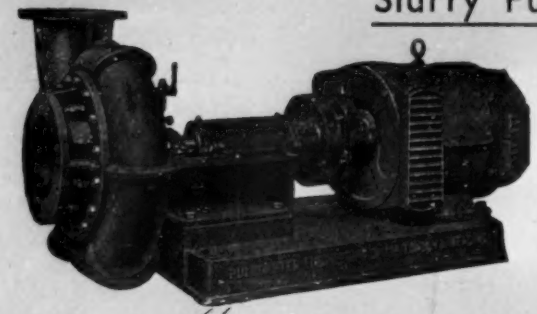
ON OCTOBER 19, last year, the latest date for which figures were available, 400 registered disabled ex-coal miners affected by pneumoconiosis and silicosis were unemployed in the South Wales and Monmouthshire development area, said the Parliamentary Secretary to the Ministry of Labour in a written reply to Mr. David Williams (Lab.).

Centrifugal Symbol

Centrifugal
Pumps

Pulsometer

Slurry Pumps



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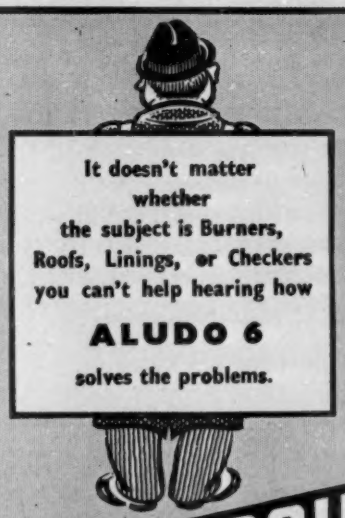

A CERAMIC HOLDINGS SUBSIDIARY

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Firebrick Manufacturers

BONNYBRIDGE SCOTLAND

Board Changes

New Directors for Lancashire Steel

CHAIRMAN of Wrights' Ropes, Limited, and its subsidiary, the Rollason Wire Company, Limited, Mr. G. J. W. Turner has been appointed to the board of the LANCASHIRE STEEL CORPORATION, LIMITED. Mr. Turner is also a director of Stampings Alliance, Limited, Wellington Engineering Works, Limited, and Wellington Tube Works, Limited.

MR. G. J. W. TURNER

Also appointed to the Lancashire Steel Corporation board are Mr. Patrick Campbell Hall and Mr. Jonathan Backhouse. Mr. Hall is chairman of Hall Engineering (Holdings), Limited, and British Reinforced Concrete Engineering Company, Limited, and a director of BRC subsidiaries, of Hall & Pickles, Limited, and a number of other companies. Mr. Backhouse is a managing director of J. Henry Schröder & Company Limited, merchant bankers, and a director of a number of companies including Power Investment Corporation, Limited, and the Rover Company, Limited.

INDUSTRIAL FAN & HEATER COMPANY, LIMITED—Mr. I. B. Cooke has been appointed a director and general manager.

G. BEATON & SON, LIMITED—Mr. W. P. Stote has been appointed managing director of the company, a member of the George Cohen 600 Group, Limited.

WAILES DOVE BITUMASTIC, LIMITED—Mr. Thomas MacDonald, managing director of the company, has been appointed chairman and Mr. Sidney C. Gardner has been appointed to the board.

GUEST, KEEN & NETTLEFOLDS (SOUTH WALES) LIMITED—Mr. Leslie Davies, labour manager, who has been with the company throughout the 28 years of his career, has been appointed a director.

DOWTY NUCLEONICS, LIMITED—Mr. T. D. H. Andrews, director and general manager, has been appointed managing director, and Mr. D. G. A. Thomas, the chief engineer, has been appointed a director.

BOWTHORPE HOLDINGS, LIMITED—Mr. Norman L. Keen, a director for 20 years of the subsidiary companies, Bowthorpe Electric Company, Limited, and Bowthorpe Engineering Company, Limited, has joined the board.

PULSOMETER ENGINEERING COMPANY, LIMITED—Mr. Eric Sanders has resigned from the board on a disagreement over policy. He joined the board when the company acquired B.A.L., Limited, in 1958, of which he was chairman and managing director.

REDLER INDUSTRIES, LIMITED—Mr. Herbert V. Cozens, chairman of Cozens & Sutcliffe (Holdings), Limited, has been elected chairman of the company and of its subsidiaries. Mr. Francis G. Bullimore, a director of Cozens & Sutcliffe (Holdings), Limited, has also been elected to the boards of these companies. Mr. S. H. Forbes, a director and secretary of Redler Industries, has been elected vice-chairman of the company.

NEWEY & TAYLER, LIMITED—Mr. G. Flood and Mr. H. Mole have been appointed directors of the subsidiary, D. F. Tayler & Company, Limited, and Mr. R. C. Smith and Mr. W. J. Towler have been appointed to the board of another subsidiary, Newey Bros., Limited.

AMALGAMATED LIMESTONE CORPORATION, LIMITED—Col. D. W. Cleaver, who has been chairman of the company since its formation in 1950 and a joint managing director of Amalgamated Roadstone Corporation, Limited, since 1946, has resigned from the boards of both companies because of ill-health.

SHEFFIELD WIRE ROPE COMPANY, LIMITED—Mr. R. S. H. Shepard and Mr. L. B. Devins have been appointed joint managing directors of the company. Mr. Gordon Liley has been appointed to the board of British Lead Mills, Limited. Both companies are members of the Firth Cleveland, Limited, group.

Monsanto Chemicals' Record Turnover

RECORD turnover of £18,400,000 is reported for Monsanto Chemicals, Limited, beating the previous highest figure of 1957 by £2,700,000. The dividend is raised by 1¼ per cent. to 15 per cent. and group net profits are up from £1,016,274 to £1,693,266.

With a net total of £6,880,000, direct exports represented 37 per cent. of all sales and compared with £5,430,000 for 1958. The chairman, Sir Miles Thomas, says this active trend appears likely to continue into 1960. Output expansion of several major products is being planned and new plant is being built.

Expenditure on capital projects last year totalled £1,964,273 (£3,461,106). This reduction reflects progress made in the completion of the major construction programme at the new Fawley factory.

Slot-machines for that 20-minute Factory Meal?

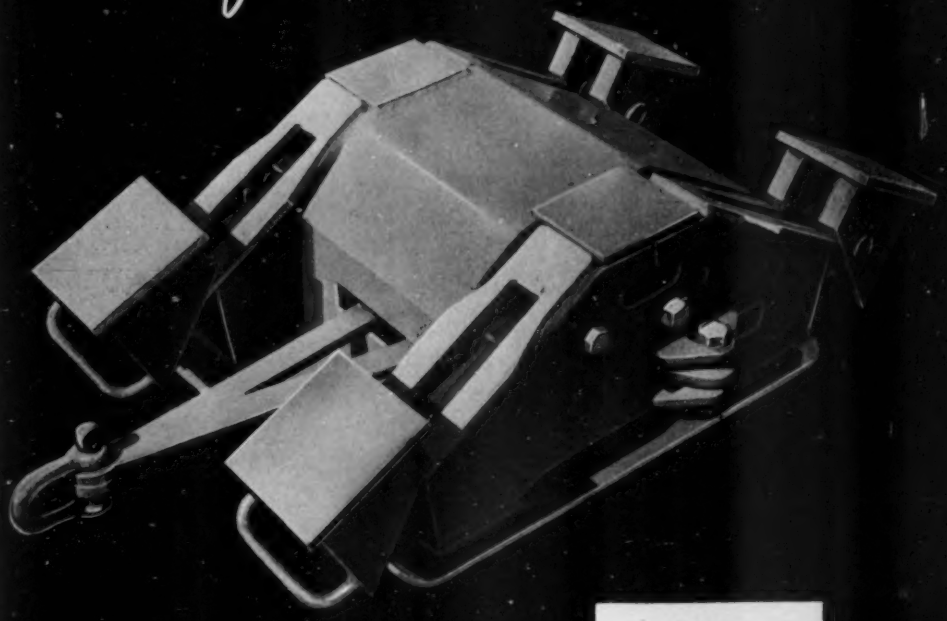
MODIFICATION in the present systems of morning breaks and midday meals would follow from the contraction of the working week, said Mr. F. N. Bird, catering manager of Newton, Chambers & Company, Limited, Thorncliffe, near Sheffield, at the annual meeting of the South Yorkshire branch of the Industrial Catering Association.

The shorter working week would mean that a meal might have to be provided in as little as 20 minutes, he said. Vending machines would be in big demand to meet this problem.

COAL IMPORTS into Western Germany dropped in January to only 511,800 tons, compared with 633,100 tons in December. Imports from the main supplier, the United States, fell to 219,800 (273,300) tons, and there were also reductions in imports from Czechoslovakia, East Germany, Poland, and the Soviet Union. The only unchanged imports were those from other ECSC countries. Germany's coal exports, including those from the Saar, increased to 2,538,442 (2,159,456) tons, of which 2,095,446 (1,725,739) tons were sold inside the ECSC area, mostly to France.

Muschamp

Patented Safety Chocks



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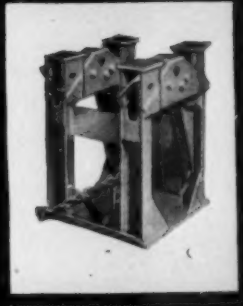

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Increases of Capital

IRON & HARDWARE COMPANY, LIMITED, Gloucester, increased by £20,000, in £1 ordinary shares, beyond the registered capital of £60,000.

CLAYTON DEWANDRE COMPANY, LIMITED, mechanical engineers, ironfounders, motor engine and chassis manufacturers, etc., of Lincoln, increased by £2,000,000, in £1 ordinary shares, beyond the registered capital of £1,000,000.

SPENCER WIRE COMPANY, LIMITED, Wakefield, increased by £886,900, in 150,000 cumulative second preference, 700,000 non-cumulative third preference, and 36,900 ordinary shares of £1 each, beyond the registered capital of £13,100.

FIRTH-VICKERS STAINLESS STEELS, LIMITED, Sheffield, increased by £1,000,000, in £1 ordinary shares, beyond the registered capital of £5,000,000.

SHEPCOTE LANE ROLLING MILLS, LIMITED, Sheffield, increased by £1,500,000, in £1 ordinary shares, beyond the registered capital of £900,000.

R. H. SYMONDS, LIMITED, metal dealers, etc., of London, S.W.1, increased by £30,000 in 60,000 "A" ordinary and 540,000 "B" ordinary shares of 1s. each, beyond the registered capital of £40,000.

BRITON FERRY STEEL COMPANY, LIMITED, Briton Ferry, Neath, increased by £150,000, in £1 ordinary shares, beyond the registered capital of £1,000,000.

MCKEE, HEAD WRIGHTSON, LIMITED, engineers to the chemical and petroleum industries, etc., of London, E.C.1, increased by £249,900, in £1 ordinary shares, beyond the registered capital of £100.

INTERNATIONAL HARVESTER COMPANY OF GT. BRITAIN, LIMITED, London, E.C.1, increased by £2,000,000, in £10 ordinary shares, beyond the registered capital of £3,000,000.

CLAY CROSS (IRON & FOUNDRIES), LIMITED, Clay Cross, Chesterfield, increased by £660,000, in £1 ordinary shares, beyond the registered capital of £60,000.

HALESOWEN STEEL COMPANY, LIMITED, Halesowen (Worcs), increased by £100,000, in 4s. ordinary shares, beyond the registered capital of £215,000.

STANDARD RANGE & FOUNDRY COMPANY, LIMITED, Watford, increased by £160,000, in 5s. ordinary shares, beyond the registered capital of £100,000. Each of the existing 90,000 ordinary shares of £1 has been sub-divided into four ordinary shares of 5s.

MORGAN CRUCIBLE COMPANY, LIMITED, London, S.W.11, increased by £3,000,000, in 2,720,000 "A" ordinary and 280,000 "B" ordinary shares of £1 each, beyond the registered capital of £7,000,000.

WELLINGTON TUBE WORKS, LIMITED, Great Bridge, Tipton (Staffs), increased by £825,000, in £5 unclassified shares, beyond the registered capital of £25,000.

THERMIC EQUIPMENT & ENGINEERING COMPANY, LIMITED, Dibdale, Dudley (Worcs), increased by £22,000, in £1 ordinary shares, beyond the registered capital of £18,000.

WEBSTER & COMPANY, LIMITED, hemp, steel, and iron wire rope manufacturers, colliery owners, etc., of Sunderland, increased by £100,000, in £1 shares, beyond the registered capital of £60,000. The £5 shares have been sub-divided into £1 shares.

Canada Enters Thermal-Electric Generating Market

CANADIAN electrical industry is now concentrating on the manufacture of thermal-electric generating equipment. In the past, Canadian manufacturers have not been able to compete with the lower prices of foreign plant, and have confined themselves to the production of hydro-electric generating equipment. Now, two of the largest Canadian manufacturers, both subsidiaries of American corporations, have undertaken orders for gas and steam turbine generators.

Canadian Westinghouse, Limited, subsidiary of the Westinghouse Electric Corporation, is building a 28,000 kW gas turbine generator for use on the Prairies and has orders for three smaller turbines from unnamed clients. In addition, the company is to build a 2,000 kW steam turbine generator for the US government, and a 10,000 kW generator for Saskatchewan.

Canadian General Electric, Limited, are working in conjunction with Associated Electrical Industries, Limited, of London, on an order for six 8,040 h.p. gas turbine generator units from the Quebec Hydro-Electric Power Commission. The bulk of this installation will be undertaken by the British concern, presumably in an effort to lower the cost.

Coal Wins Customers from Oil in Yorkshire

COAL is reasserting itself in the Yorkshire sales region of the National Coal Board in its competition with oil. Mr. W. H. Sales, chairman of the North Eastern Divisional Coal Board, told a Press conference last week that customers in the region are being gained at the rate of almost 500,000 tons of coal a year.

He said that 24 new buildings, including hospitals, libraries, works, schools, and fire stations, are to be heated with coal, even though oil has been considered. There were also 29 existing buildings, consuming 250,000 tons a year, in which coal or coke would be used, though here, too, oil was considered. In addition, the board knew of three works which had reverted from oil to coal. Together, they consume about 20,000 tons a year.

"This is the beginning of the advance," said Mr. Sales. The divisional secretary, Mr. M. S. Bates, commented: "We are finding that it is having a snowball effect. All these users have been convinced by economics alone. The nine salesmen and six technical men in the division know that is the only way to sell; we have not made any attempt to trade on social consequences of closing down pits and throwing men out of work, or anything like that."

Pit Worker Killed in "Freak" Accident

CHANCE "in two or three million" killed Mr. Peter Alexander (23) in a freak accident at Bestwood Colliery (Notts), an Arnold inquest jury was told last Friday. The Nottingham District Coroner, Mr. C. A. Mack said that Mr. Alexander was helping to move a 15 ft. steel girder, when a stone fell from the roof without warning.

Mr. John Percival Tilley, charge ripper, said the area was safe for working and there was no indication that there would be the slightest fall. The jury returned a verdict of Accidental Death.

A verdict of Accidental Death was also recorded at a Worksop inquest on Friday on Mr. Frederick Raymond Groom (29), miner, of Worksop, who was killed by a prop dislodged by a stone fall at Thoresby Colliery (Notts). It was stated that the area where the accident occurred had been trouble-free for a long time.

International Harvester Dollar Tractor Sales Soar

NEARLY 2,000 wheeled tractors were shipped to the USA by the International Harvester Company of Great Britain, Limited, in the last quarter of 1959. According to Board of Trade figures, this represented more than half the number of all tractors exported to the US during the period. The company's share in this market during the first three quarters of 1959 was about 19 per cent.

Mr. O. G. Voss, IH managing director in Great Britain, commented: "We believe that at no time has so large a forward order been placed by the USA for a single model of a British tractor. At present, over half the production of our Bradford works is being shipped to the United States and Canada."